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o1 introduction



LaSalle Park is one of Buffalo's most unique yet underappreciated parks and is arguable one of the greatest green spaces along the entire Buffalo Waterfront. This relatively large waterfront park within view of the city's skyline, already offers a variety uses and views. It is one of the only views to the lake not blocked by a breakwall (like at the Outer Harbor). While LaSalle Park has been in existence for decades, it's location as a waterfront park has never really been capitalized on. The fact that most of the park is manicured and structured with active uses has in essence turned its back on the lake rather than embracing it. The



preponderance of ballfields and active recreation has been both a blessing and hindrance to bringing people down to enjoy the park. Given the recent resurgence of interest and attention on Buffalo's waterfront, it would be a missed opportunity not to begin to refocus much of LaSalle Park's features towards the water.

This could follow the lead of the 1998 LaSalle Park Master Plan which suggested naturalizing underutilized sections of the park (which could also reduce mowing needs and redirect scarce resources), and even recommended naturalizing the shoreline itself. An extensive planting program alone could offer a new environmental and educational focus for the park and bring a native lakefront landscape closer to the Lower West Side and adjacent to the downtown core. LaSalle Park serves as a destination



for what some may say is an under-served part of our community; a community that is arguably the most diverse within the City of Buffalo. In addition, the park touches a wide diversity of socioeconomic interests as well, from Waterfront Village to the Lower West Side and up to the Peace Bridge area. LaSalle Park provides residents with the unique opportunity to interact with nature and "get away from it all" within a relatively short walk or bike ride from their homes. This



project serves to identify opportunities to enhance those experiences on the southern end of LaSalle Park by providing increased improved visitor better safety, access. experience, directional and interpretive signage, roadway and parking alternatives, habitat improvements, and rehabilitation and re-purposing of sea plane ramp, as well as shoreline and habitat restoration improvements.



02 project process



Process

The design effort began with a kick-off meeting and a site walk with City personnel to identify concerns, desired park improvements, and any special requests that may impact the design process and site improvement detailing.

The first Steering Committee was held on February 13, 2017 at the Niagara Branch Library. At this meeting scope of the project was presented, the previous Master Plan was reviewed, and then the floor was opened to receive comments regarding potential improvements to the park. The presentation and meeting notes are included in the appendix.

After the first public meeting an initial site analysis was conducted. This analysis observed the conditions of the buildings, athletic facilities, roads, pathways, playgrounds and general site amenities. Utilizing the information gathered from the site analysis, comments received from the first public meeting and outreach performed by the City three concept level alternatives were developed.

The three concepts were presented on April 25, 2017 at a public meeting. Meeting participants commented on each of the concept plans in terms of what was favorable and not favorable. The presentation and the concept plans were distributed electronically to all members of the Steering Committee as well as the public in general. Additional comments were received via email and phone regarding the elements contained within each of the three concepts. The concepts, presentation and meeting notes from public meeting number two are included in the appendix.

Using the comments received, as well as consultation with City personnel as it related to the maintenance and durability of the design elements presented in the three concepts, a preferred alternative concept was developed.

The preferred concept was presented at a public meeting on June 8, 2017. The plan was well received with some minor comments from the participants. An alternative was presented to relocate the Bark Yard dog park, however after discussions with the stakeholders involved in the relocation of the dog park and tee ball diamonds it was determined to maintain this park feature in its present location.

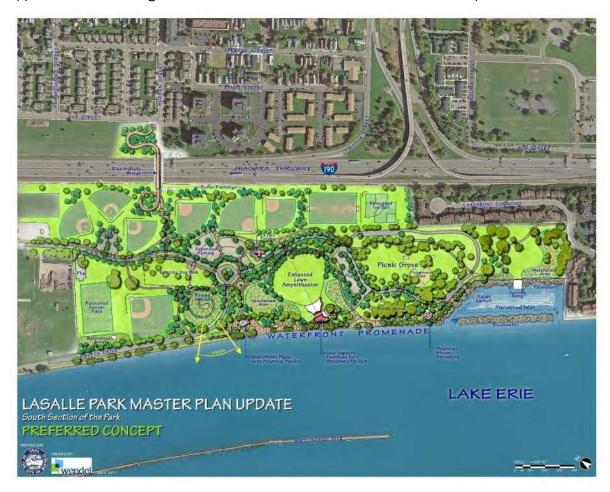








The preferred concept plan was advanced to a schematic level plan taking into consideration the comments received from the June 8th public meeting as well as additional input received through the City's outreach. Understanding that constructing all of the improvements depicted on the schematic plan at once was not economically feasible the overall plan was broken into a phased approach. The following section 'Recommendations' outlines the individual phases.





03 recommendations



Recommendations

The preferred concept plan was advanced to a schematic level plan and the overall plan was broken into a phased approach. The phases identified have been organized into logical projects that can be accomplished without major disruption to the park patrons or sports organizations over extended periods of time. It should be noted that several of the phases are presented in a chronological order, while others may be constructed at any point in time. Phases that are dependent on one another are noted accordingly.

A general recommendation for LaSalle Park is to change the park hours. LaSalle Park is currently open 24-hours as it is designated as a fishing access point. During the course of public engagement throughout the design process numerous comments were received regarding non-fishing activities that occur within the park overnight, and there was a general consensus that the quality of fishing along LaSalle Park was not as desirable as other locations along the Buffalo waterfront. It is recommended that an ordinance amendment to the City Charter and Code be made to close LaSalle Park at 10:00pm.

An element that received general consensus during the public engagement process was to improve the pedestrian bridge connecting Hudson Street to LaSalle Park. A desire was expressed to make the bridge more inviting and potentially bicycle friendly. Improvements or replacement of the existing bridge cannot be solely undertaken by the City as they do not own the bridge. It is recommended that the City begin discussions with the agencies have jurisdiction, including NYSTA and CSX, to initiate a process for implementing improvements to the pedestrian bridge.

Phase One Improvements (Refer to Sheet L200)

The City had secured \$500,000 from the Niagara River Greenway Commission to implement the improvements identified in Phase One including repairs and renovations to the Pavilion, installation of security cameras to enhance Shoreline Trail safety and improvements to the waterfront experience within LaSalle Park.

Pavilion improvements include:

- Repairs to the tensile structure fabric. Several small holes and tears were noted. The
 fabric was reviewed by a representative from Bird Air that had indicated the repairs are
 minor and required to prevent further deterioration. The representative noted that the
 fabric has at least ten more years of serviceable life.
- Repairs to the metal roof deck on the larger storage building. Minor areas of the metal
 roof have deteriorated and require replacement. The paint on the underside of the metal
 deck is falling off, the underside of the deck requires sandblasting and power washing to
 remove the paint, the surface primed and re-painted.
- The exterior concrete panel treatment on the larger storage building requires repair. The
 underlying CMU wall appears to be structurally sound. The cracking observed appears to
 be cosmetic and it is recommended to repair the cracks, prime and paint the entire
 exterior of the building.
- The four smaller buildings are recommended to be prepped, primed and painted.
- The metal doors and frames on all five buildings are rotted and the hardware is marginally operational. It is recommended to replace the doors.



- While the roofs of the five buildings were not accessible during the site analysis it is understood from discussions with parks staff that they are reaching their useful life, and have experienced some damage from trespassers accessing them as well as debris and garbage being thrown on them. It is recommended, conservatively, to replace the roof membrane on each of the five buildings.
- The electrical systems within the facility are generally unsafe. It is recommended to replace the disconnects, distribution panel, receptacles and lighting throughout all five buildings. Additionally a 200A company switch should be provided to permit a safer connection for acts to connect their portable equipment.
- Constructing an ADA compliant sidewalk to the stage elevation.

Security cameras to enhance Shoreline Trail safety are recommended. It is currently assumed that two cameras should provide the visual coverage required. One camera would be located along Amvets Drive, potentially near the Pavilion. The second camera would be located near the concession building. The exact placement of the cameras and poles would be determined by the BPD and their consultants.

In the south-west corner of the park there is a small seating area with four benches. The pavements in this area are unsafe, the benches are damaged, and the seawall exhibits surface deterioration.



Existing conditions

It is recommended to renovate this area and begin to develop a "node" as depicted in the preferred concept and schematic plans.

The work would include:

- Removal of the pavements, benches and one damaged tree.
- Parging of the seawall.
- Excavating the area where settling has occurred (pneumatic excavation adjacent to
 existing tree roots) and installing an underdrain system to convey water to the existing
 storm system. Installing a geotextile membrane and backfilling with a drainage material.
- Removing and replacing the railing with a compliant railing within the limits of the new construction.
- Constructing new decorative (colored and/or stamped) concrete plaza with benches.



To the east of the south-west a small seating area exists with two benches. The pavement in this area is unsafe and the benches are damaged.



Existing conditions

It is recommended to remove the pavements and benches and reconstruct the seating area approximately 30-feet to the west of its present location, away from the mature tree. In addition to relocating the seating area minor modifications to the existing railing, in front of the benches, would be required to meet compliance.

Park Road Re-alignment (Refer to Sheet L201)

The main focus of this project is divert vehicular traffic from the future waterfront promenade. The existing Amvets Drive south of the water plant would be demolished to the recently constructed portion of road at the south end of the park. In this phase it is recommended to maintain a 12-foot wide portion of the existing pavement to provide a second means of emergency access to the south end of the park. Traffic between Amvets and the circle would be converted to one-way towards the east. Between the circle and the access driveway to the pavilion would be two-way traffic. One-way traffic would be maintained through the southern loop.

It is suggested to include the parking lot in this phase as a large number of parallel parking spaces along Amvets Drive will be removed. Parallel parking is proposed along the inside of the new loop road, where the traffic is one-way.

The construction cost estimate for this phase includes providing new street lights along the new road, similar to the lights at the north end of the park along DAR Dr.



Shoreline Trail Spur (Refer to Sheet L202)

During the public engagement process there was a strong desire to provide off-road trails for walking and biking. This phase would construct a 15-foot wide asphalt paved trail that would accommodate pedestrians and cyclists, and connect the existing off-road portion of the Shoreline Trail in a north-south direction along the eastern side of the park. In future phases of improvements a waterfront promenade and additional enhancements are proposed. The waterfront promenade enhancement, while primarily geared for pedestrians, will accommodate a 12-foot wide "trail" in a different pavement that can accommodate cyclists and emergency vehicles. Providing this off-road portion of trail will provide a safer link of the Shoreline Trail through the park, minimizing the length of trail that is utilizing bicycles lanes on the road, and will remove the shared road portion of the trail link. It is suggested to complete this phase prior to the waterfront promenade as that work will create more of a pedestrian space that may not be conducive to cyclists using the trail as a commuter route.

Waterfront Promenade (Refer to Sheet L203)

This phase addresses several concerns and provides pedestrian access to the water's edge. While according to the ACOE report the condition of the seawall is 'good', there are several areas where undermining has been observed. The undermining is a result of both overtopping and storm water being essentially trapped behind the wall. This phase includes a mitigation to relieve the trapped water by constructing a subdrainage system behind the wall. The construction cost estimate takes a conservative approach and assumes the entire length of the wall would be excavated. It is recommended when this phase of detailed design is entered additional survey and test pits be performed to better define the limits of the full depth and width mitigation measures. It is recommended to provide the underdrain pipe for the length of the project.

With pedestrians at the water's edge a new code compliant railing will be required.

Pavilion Support Building (Refer to Sheet L204)

The existing pavilion does not provide the required support facilities such as restrooms and changing rooms that many of the users, bands and entertainment performers, would expect to be present at a venue of this type. Under the current conditions performances have been renting recreation vehicles to provide support facilities. It is recommended to construct a building adjacent to the pavilion that would house restrooms, changing facilities including a shower, a green room or gathering space, and a small storage room/office space. It is understood that the building would not be open to the general public, and that the primary use of the facility would be for performances at the pavilion.

As detailed design progresses it is recommended that additional survey be completed to determine the location, sizes and conditions of the sanitary sewer system that is indicated on the topographic survey provided during the conceptual design phase. The topographic survey indicates a sanitary manhole approximately 400-feet to the north of the proposed building, and there appears to be sufficient grade to permit the installation of a gravity sewer to this connection point. If the existing sanitary sewer service is inadequate a pump station and force main would be required to connect to the existing sanitary sewer for the existing concession stand. The construction cost estimate for the building does carry some contingency to incorporate this in the event it is required.



Promenade Enhancements (Refer to Sheet L205)

Expanding on the development of the waterfront promenade, the enhancements include the addition of two shelters or shade structures to act as focal points or nodes. This phase would also formalize the connection of the Shoreline Trail along the waterfront by providing a 12-foot "trail" utilizing a different pavement treatment, possibly asphalt for continuity or a colored concrete. Providing this 12-foot wide "trail" along the waterfront will help to prevent pedestrian and cyclist conflicts along the water's edge. Additional lighting, benches, plantings and other amenities will enhance the park user's experience.

<u>Concession Area Improvements</u> (Refer to Sheet L206)

The improvements shown on Sheet L206 can be accomplished without the need to complete other phases, and can occur earlier or later in the development of the park. The improvements include, removing the existing brick pavement and constructing concrete pavement around the concession building, expanding and re-orienting the parking lot, tree plantings and other amenities.

Walking Trails (Refer to Sheet L207)

During the public engagement process there was a strong desire to provide "purposeful" walking trails through the park. These trails would be geared for walkers or families with strollers that are looking to recreate without the potential conflicts with vehicles or cyclists. The proposed trails connect various elements within the park, as well as create new nodes or destinations. The trails would be constructed of asphalt pavement, with areas using an imprinted and colored concrete to add focal interest. Benches would be installed at strategic locations. Tree plantings would help to define the trails and provide shade and interest. The trails as depicted can be implemented after the road re-alignment and Shoreline Trail spur have been completed.

Overlook (Refer to Sheet L208)

Concept A depicted a raised mound, similar to the mound and spiral walkway at Wilkeson Point. Many positive comments were received to include a park feature of this nature at LaSalle Park. The raised mound or overlook would provide a commanding view of the lake and it was suggested that this would provide a spectacular location for taking in the sunset.

It is currently assumed that a bulk of the fill material required for the construction of the mound would be generated through the other construction phases in the park, such as the road realignment.

The spiral walkway would rise gently at a 3% slope. The side slopes of the mound would be planted with a low-grow seed mix to minimize the need to mow the steep slopes.



Athletic Improvements (Refer to Sheet L209)

The improvements shown on Sheet L206 can be accomplished without the need to complete other phases, and can occur earlier or later in the development of the park. However it should be noted to reduce the inconvenience of taking playing fields out of service a sequence of construction has been developed:

- 1. Construct new tee ball diamond. It is understood that one game field is needed.
- 2. Construct new soccer field and parking. Two existing soccer fields remain in use.
- 3. Renovate existing full size soccer field. One existing and the new soccer field in use.
- 4. Construct second tee ball diamond.

Other improvements identified in the opinion of construction costs, such as repairs to existing fencing, replacing bleachers, and replacing fencing beyond its useful life, can be accomplished at any point in the park development.

Shoreline Improvements (Refer to Sheet L210)

The improvements depicted on Sheet L210 are preliminary concept level designs. The improvements would require coordination with multiple agencies, and require hydrological and other environmental studies in order to begin estimating the construction costs to implement. Therefore, an opinion of probable constructions costs, or even engineering, is not provided in this report.

During the public engagement process there were many suggestions offered as to what to do in the area of the seaplane ramp. Each of the concepts developed approached improvements in this area of the park differently.

One park element that gained a high level of consensus was to have a car top kayak/canoe launch near the seaplane ramp area. Suggestions ranged from performing repairs to the seaplane ramp itself and using the structure as the launch or constructing a stand-alone floating accessible kayak/canoe launch. It should be noted that locating a floating structure at this location may prove to be difficult proposition as this area of the park is not protected by a breakwater and does regularly receive damaging winds and waves. The conceptual plans and the schematic plan do depict a breakwater to be constructed outside of the entrance channel to the Black Rock Canal. As stated earlier more detailed studies of how a breakwater at this location would affect the shoreline and potential for trapping of debris needs to be undertaken. An analysis of the ramp was conducted by Ryan Biggs, Clark Davis Engineering & Surveying. The analysis included sampling and testing of the existing concrete. In general the visible portions of the ramp were noted in poor condition with severe weathering. The compressive strength of the concrete was fairly high and the rate of carbonation is low because the concrete is dense and pore structure is discontinuous. Overall the ramp as a whole appeared to be intact and has not experienced visible settlement or listing. It is currently assumed that surface repairs can be made and the ramp be re-purposed as a car top launch.



The improvements for the seawall were presented in the ACOE report for the entire length of the park, and included steel sheet piling at locations where timber piles exist, and a rubble mound revetment along the sections where timber cribbing exists. Several other suggestions were made during the public engagement process which included docking facilities, water taxi service, and the creation of a 'naturalized' shoreline for habitat.

Entry Garden (Refer to Sheet L211)

The intention of this project is create a more appealing entry sequence into the park from the Hudson St pedestrian bridge. The improvements include new walkways and a focal garden feature. It is suggested that the focal garden be a space that can be 'adopted' by a garden club as the level of maintenance anticipated may exceed the capacity of the existing parks staff.

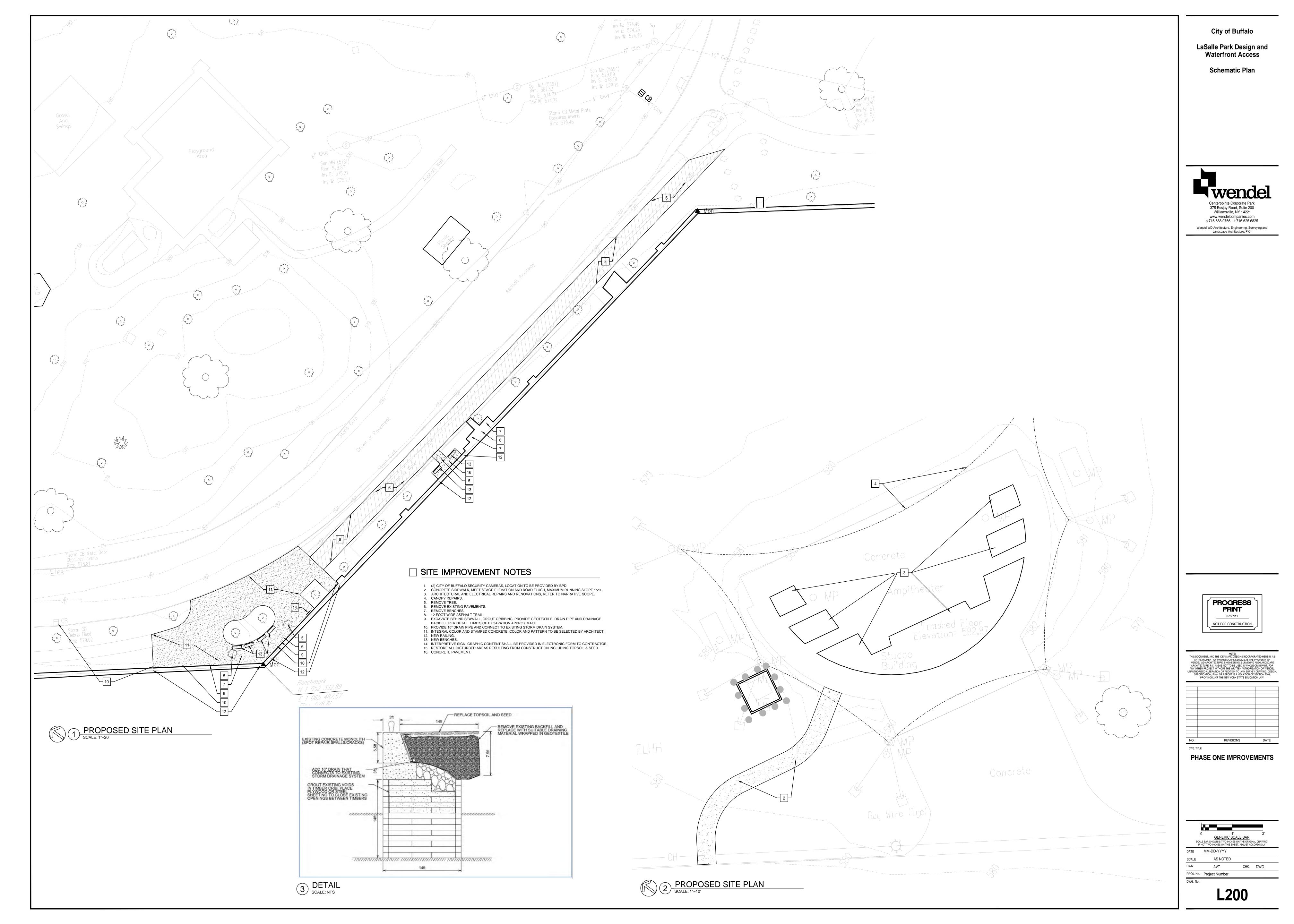
Also depicted on Sheet L211 is the development of a vegetative buffer along the east side of the park to help visually block the view of the I-190.

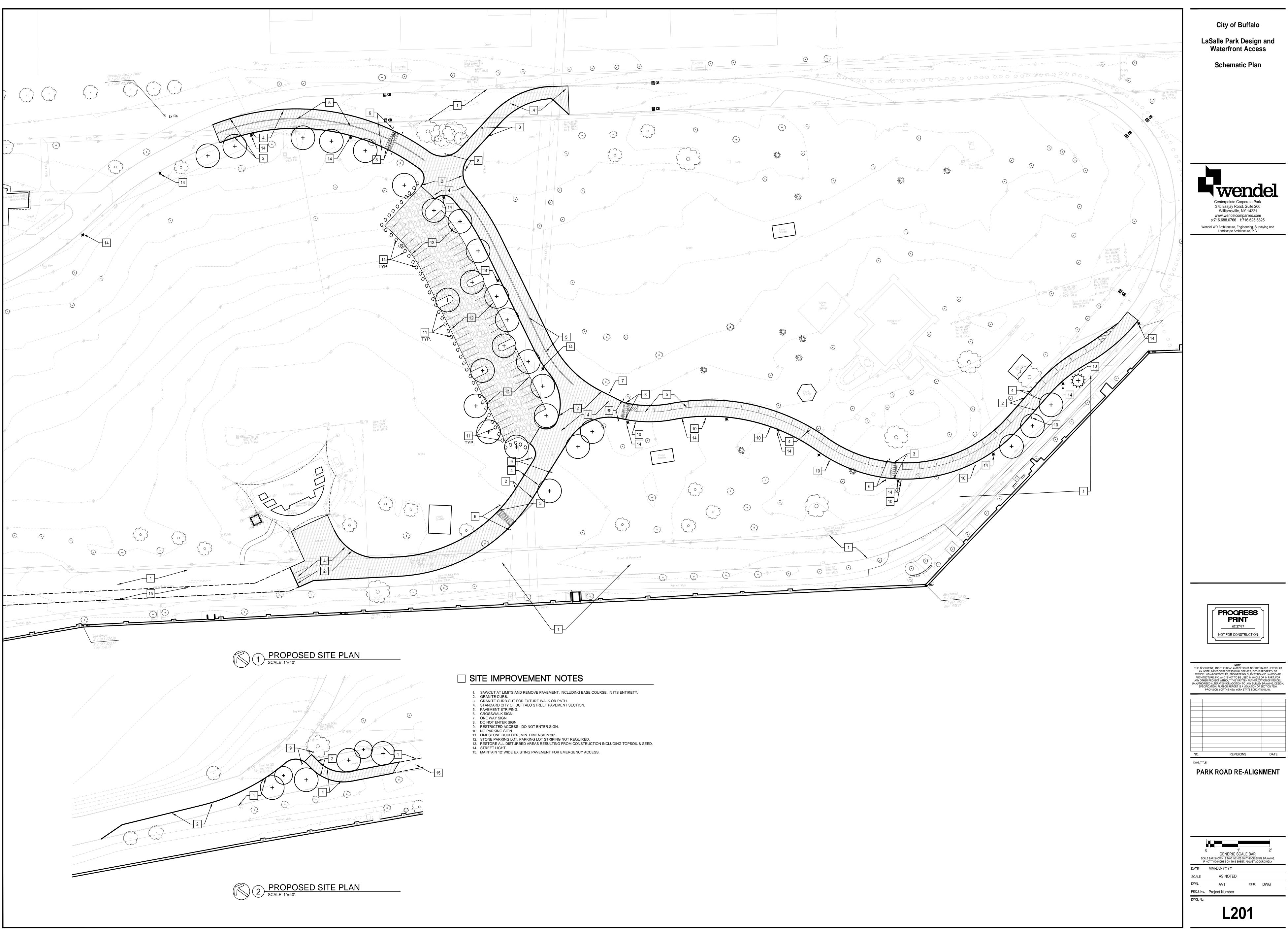
The entry walkways, focal garden and vegetative buffer may be implemented at any point during the development of the park.



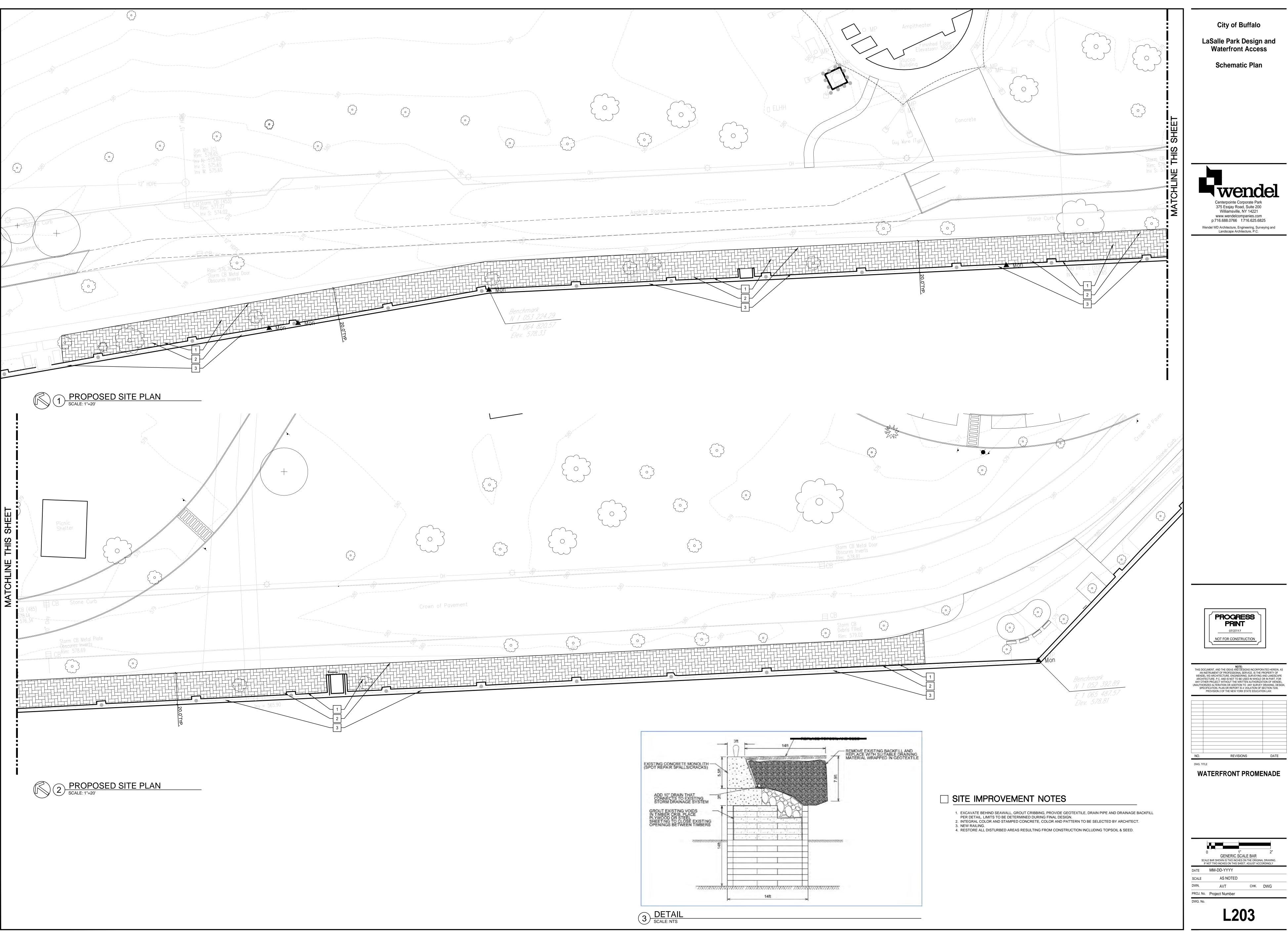
04 schematic plan sheets

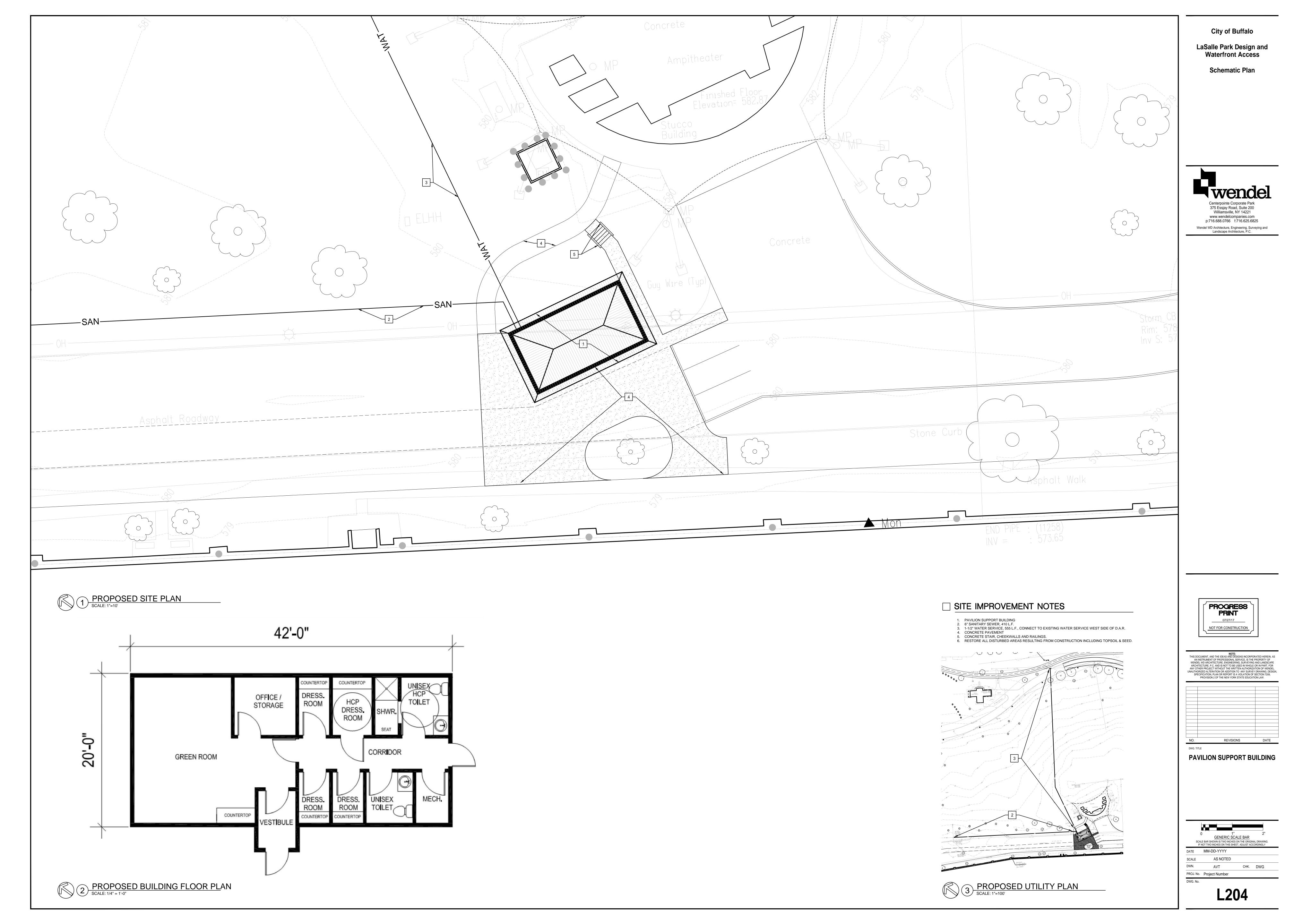


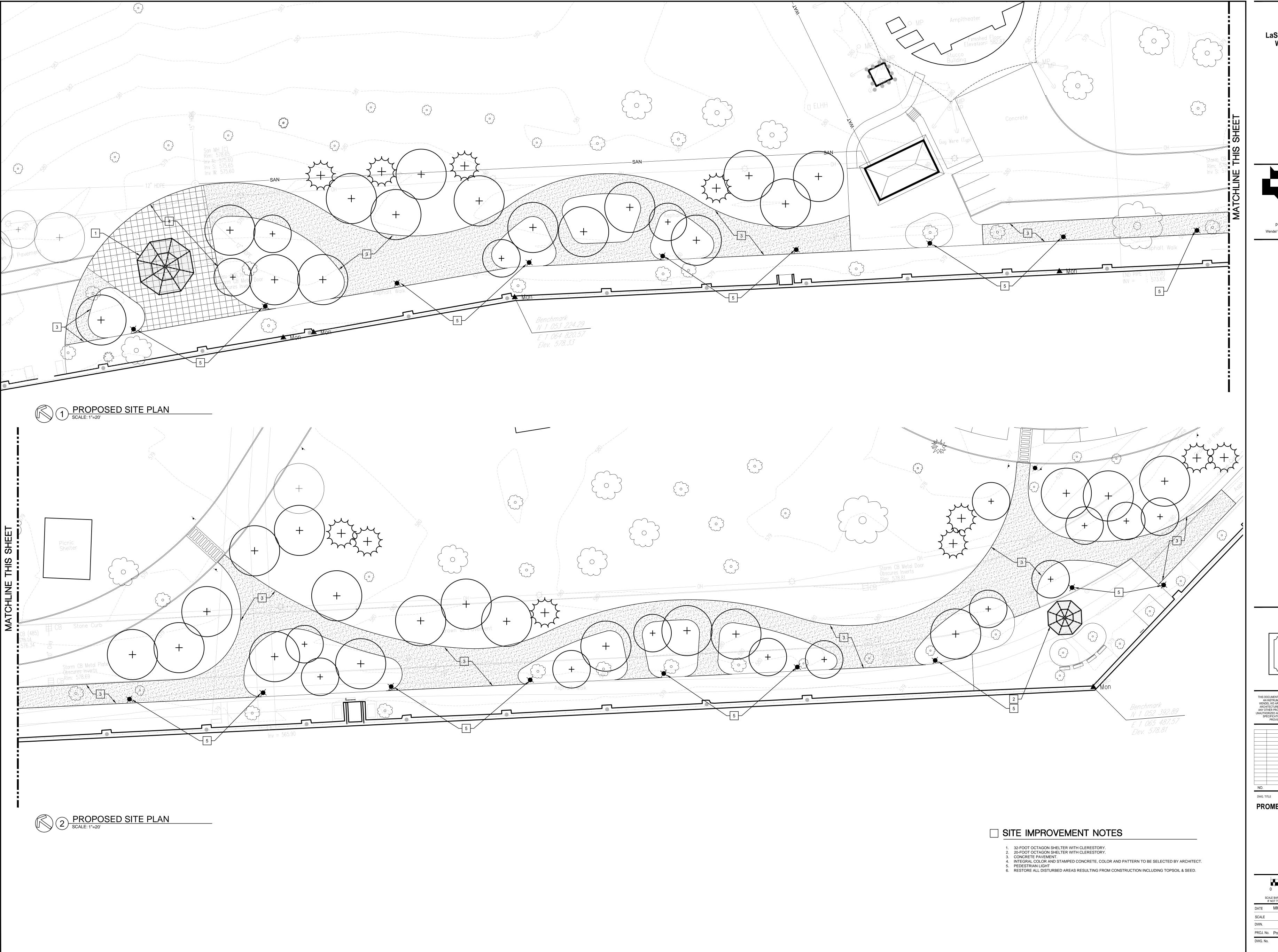












LaSalle Park Design and Waterfront Access

Schematic Plan

Centerpointe Corporate Park
375 Essjay Road, Suite 200
Williamsville, NY 14221
www.wendelcompanies.com
p:716.688.0766 f:716.625.6825
Wendel WD Architecture, Engineering, Surveying and Landscape Architecture, P.C.

PROGRESS
PRINT

07/27/17

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NO. REVISIONS DATE

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PROMENADE ENHANCEMENTS

PROMENADE ENHANCEMENTS

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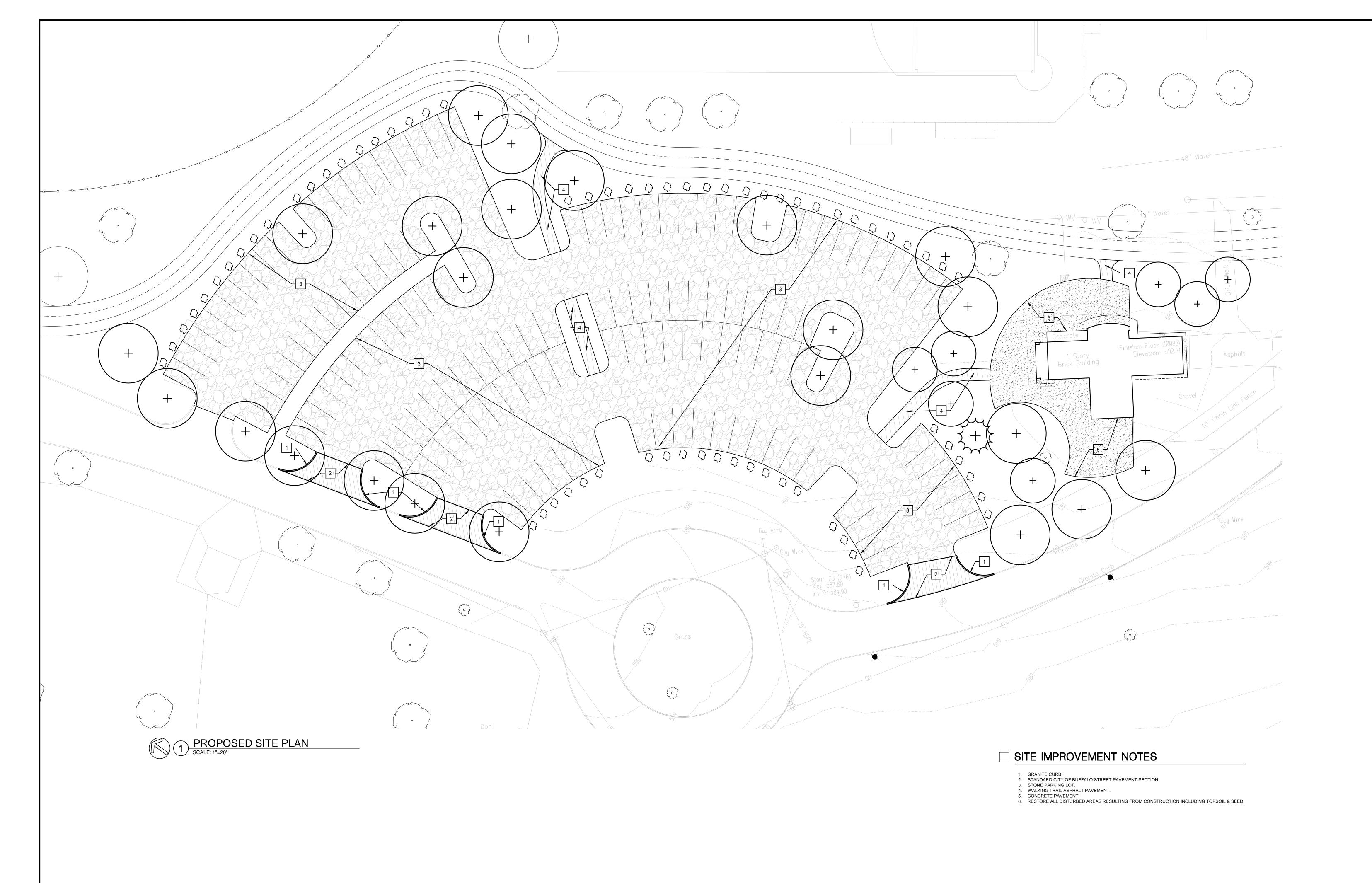
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PROJ. No. Project Number

L205



LaSalle Park Design and Waterfront Access

Schematic Plan

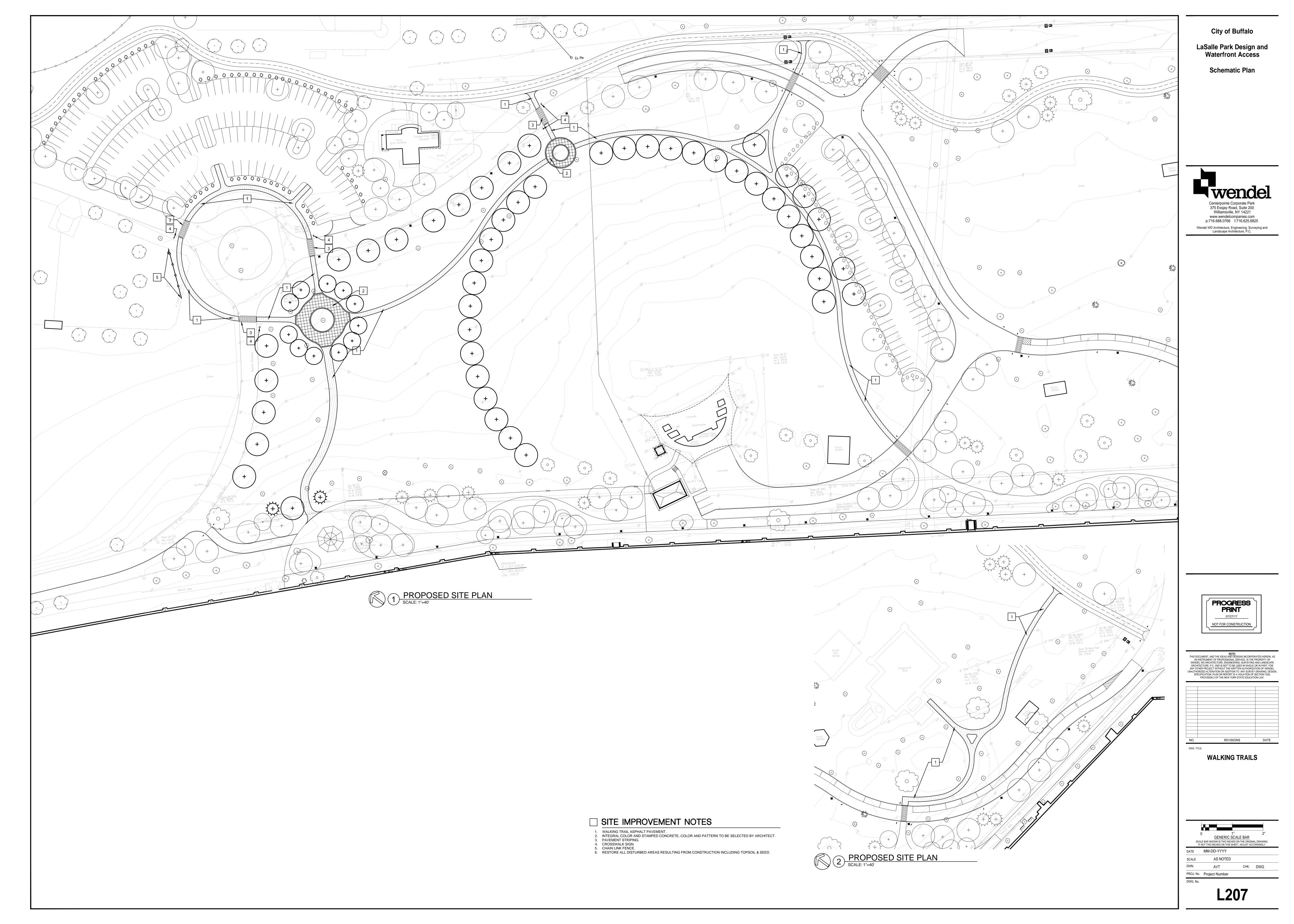


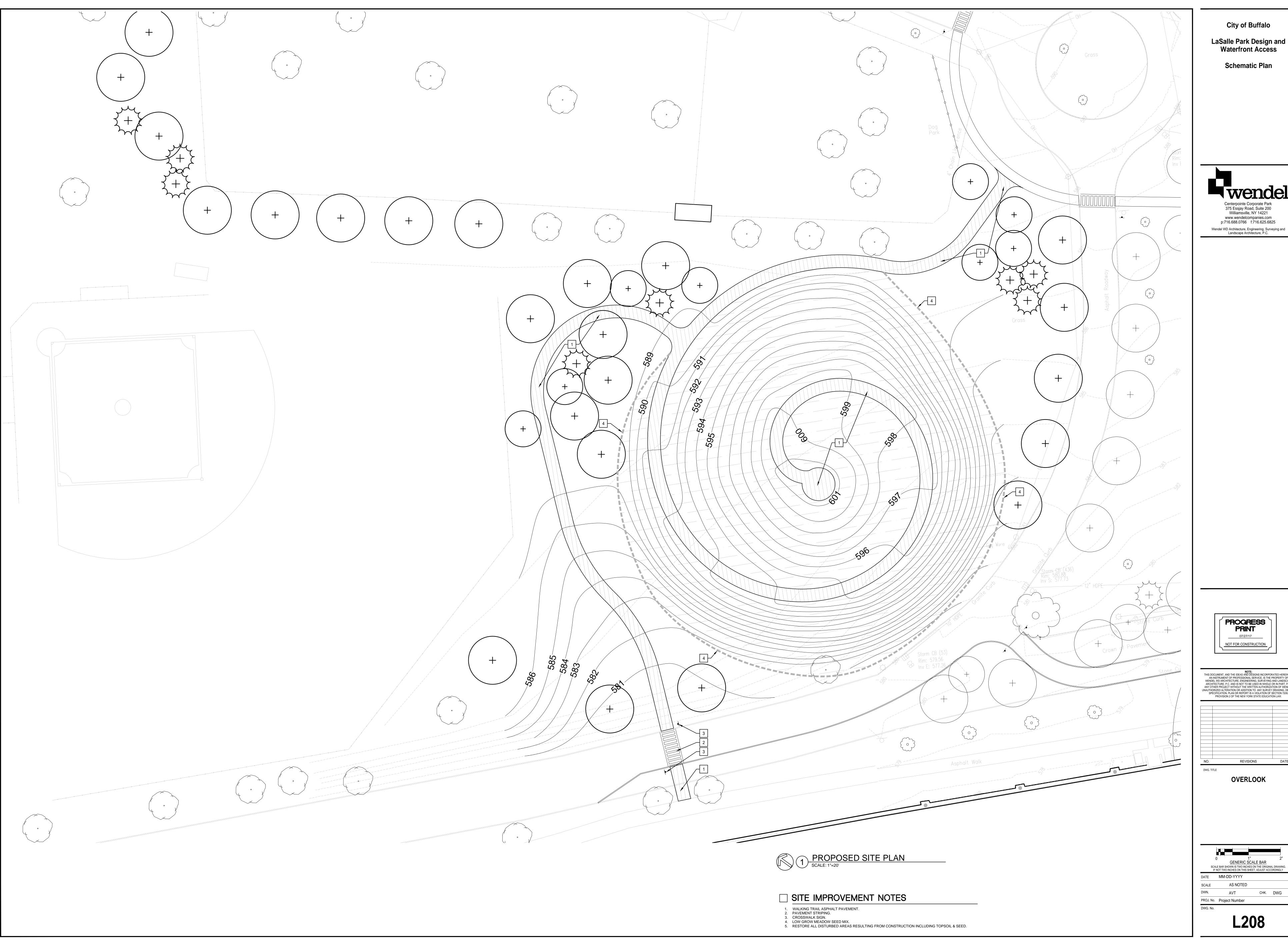


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CONCESSION AREA IMPROVEMENTS

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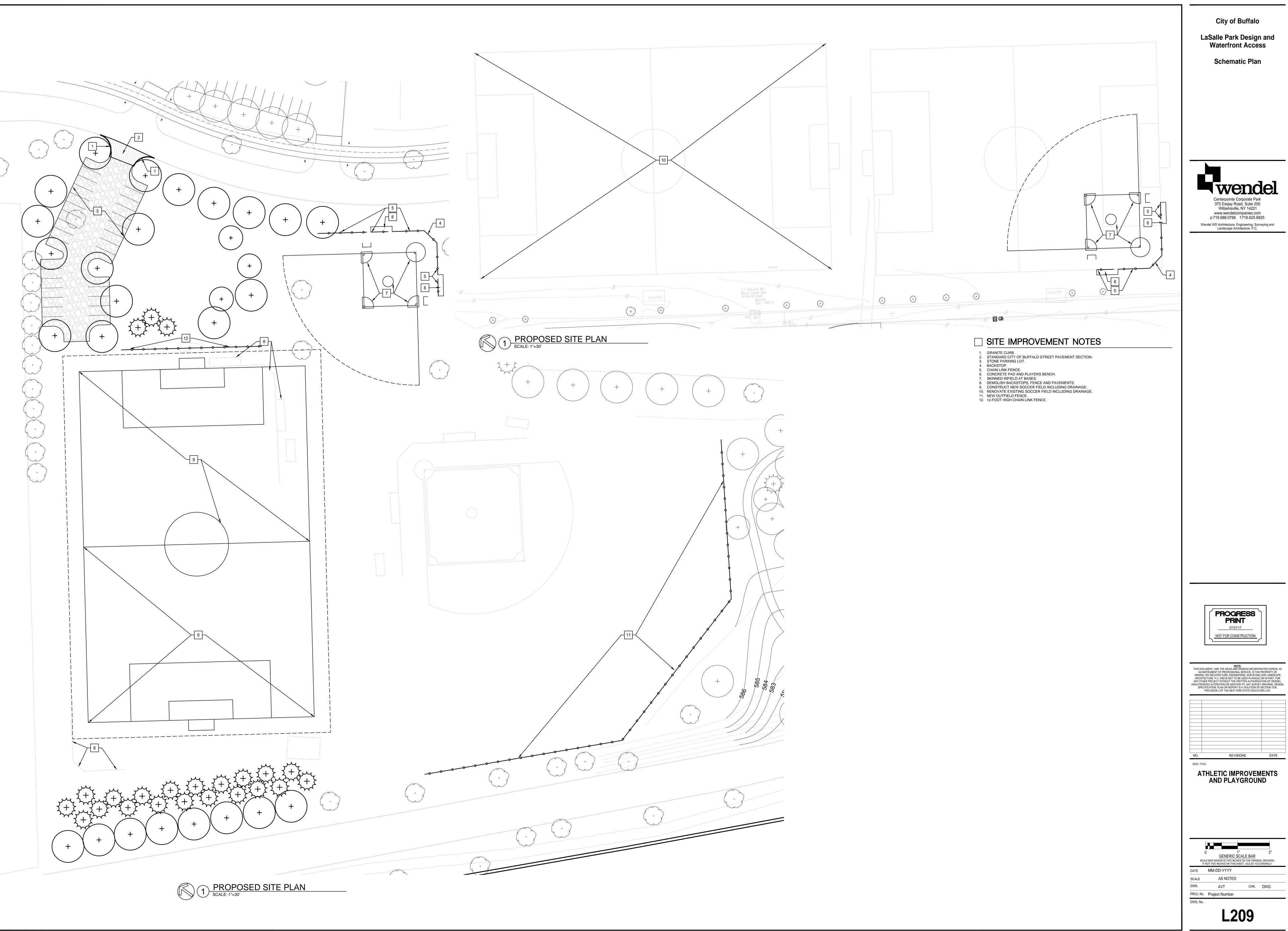




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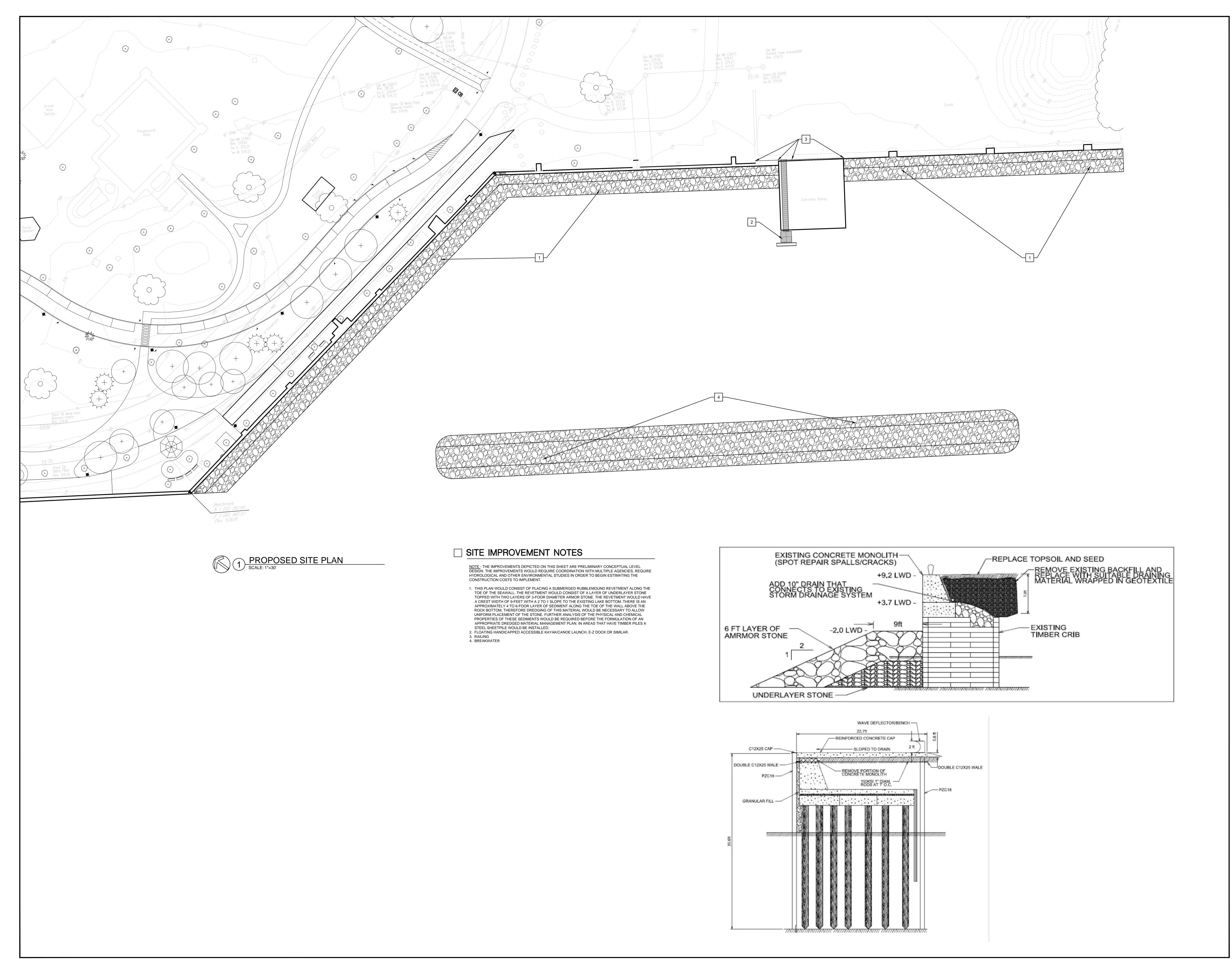
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CHK. DWG



LaSalle Park Design and Waterfront Access

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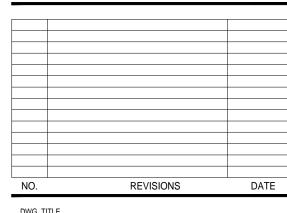
LaSalle Park Design and Waterfront Access

Schematic Plan

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SHORELINE IMPROVEMENTS

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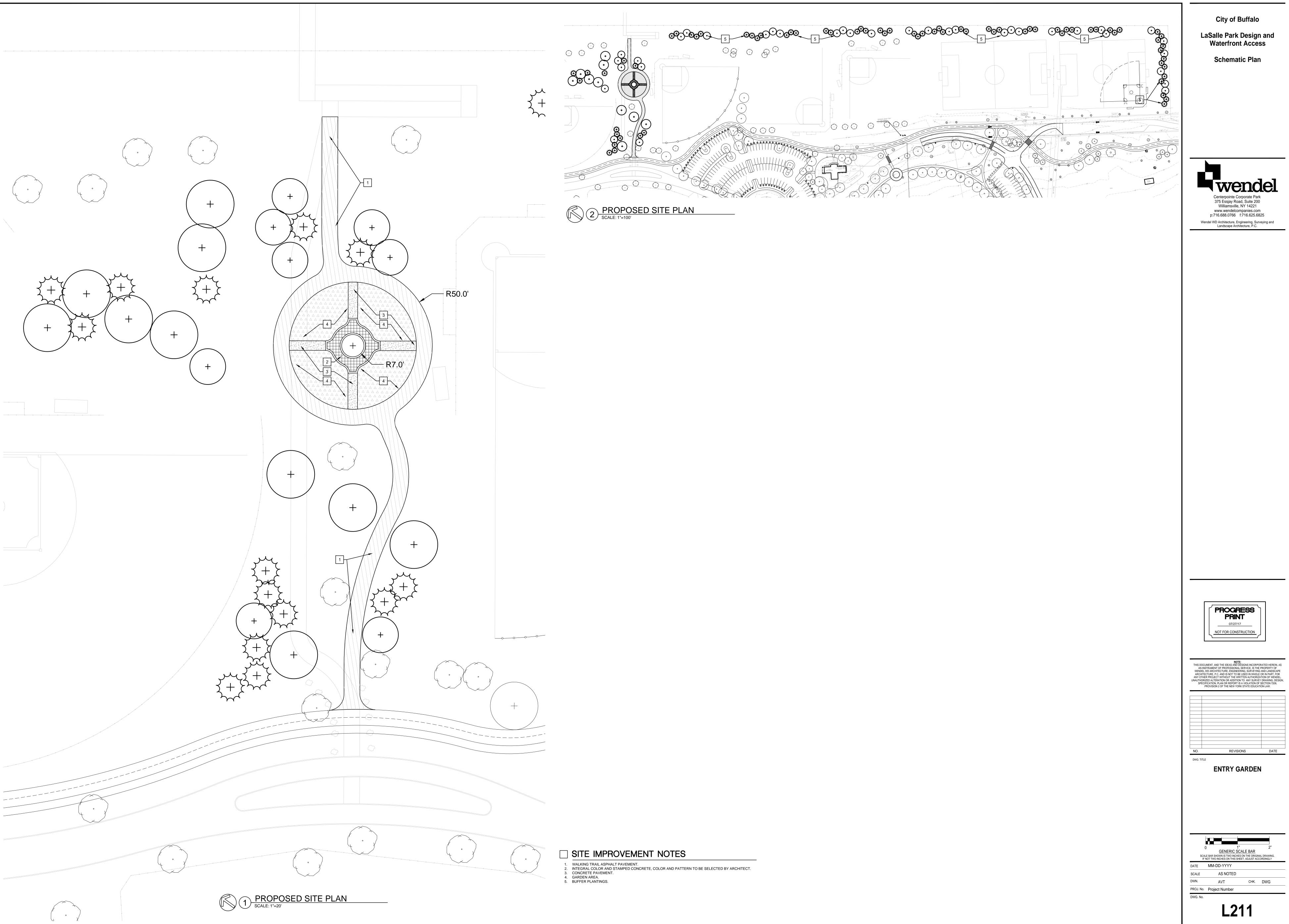
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SCALE AS NOTED

DWN. AVT CHK. DWG

PROJ. No. Project Number

L210



LaSalle Park Design and Waterfront Access

CHK. DWG

os opinion of probable construction costs





OPINION OF PROBABLE CONSTRUCTION COST SUMMARY SHEET

Project Name: LaSalle Park Design and Waterfront Access 274760

Project Location: LaSalle Park
Owner: City of Buffalo 07/05/17
07/05/17

PROJECT CONSTRUCTION BUDGET		CONSTRUCTION (Incl. GC & Contingency)		ENGINEERING @ 10%		CONSTRUCTION	TC	TAL PROJECT
						ADMIN @ 6%		COST
Phase One Improvements; Sheet L200	\$	431,200	\$	43,120	\$	25,872	\$	500,192
Road Re-Alignment; Sheet L201	\$	860,130	\$	86,013	\$	51,608	\$	997,751
Add Alternates for Road Re-Alignment	\$	335,415	\$	33,542	\$	20,125	\$	389,081
Shoreline Trail Spur; Sheet L202	\$	508,430	\$	50,843	\$	30,506	\$	589,779
Waterfront Promenade; Sheet L203	\$	1,033,660	\$	103,366	\$	62,020	\$	1,199,046
Pavilion Support Building; Sheet L204	\$	319,430	\$	31,943	\$	19,166	\$	370,539
Promenade Enhancements; Sheet L205	\$	613,880	\$	61,388	\$	36,833	\$	712,101
Concession Area Improvements; Sheet L206	\$	315,110	\$	31,511	\$	18,907	\$	365,528
Walking Trails; Sheet L207	\$	239,940	\$	23,994	\$	14,396	\$	278,330
Overlook; Sheet L208	\$	303,310	\$	30,331	\$	18,199	\$	351,840
Athletics; Sheet L209	\$	653,220	\$	65,322	\$	39,193	\$	757,735
Entry Garden; Sheet L211	\$	272,620	\$	27,262	\$	16,357	\$	316,239
TOTALS	\$	5,886,345	\$	588,635	\$	353,181	\$	6,828,160



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

	A/Approved by.			1		
BID ITEM NO.	Phase One Improvements; Sheet L200	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Inc O&P)	.	ESTIMATED AMOUNT
	PAVILION & SECURITY IMPROVEMENTS					
	Pavilion canopy repairs	1	LS	\$ 10,000.00	\$	10,000.00
	Pavilion architectural repairs				T	
	Metal deck - patching	1	Allow	\$ 1,400.00	\$	1,400.00
	Metal deck - sandblast and pressure wash loose paint	1	Allow	\$ 5,400.00	\$	5,400.00
	Metal deck - prime and 2 topcoats paint	1	Allow	\$ 3,700.00	\$	3,700.00
	Exterior stucco - crack repairs	1	Allow	\$ 3,800.00	\$	3,800.00
	Exterior stucco - prime and paint	1	Allow	\$ 7,500.00	\$	7,500.00
	CMU walls - sandblast and pressure wash loose paint	1	Allow	\$ 5,100.00) \$	5,100.00
	CMU walls - prime and paint	1	Allow	\$ 6,500.00	\$	6,500.00
	Metal doors and frames (single) - remove and replace	6	Ea	\$ 2,100.00	\$	12,600.00
	Metal doors and frames (single) - prime and paint	6	Ea	\$ 250.00	\$	1,500.00
	Metal doors and frames (double) - remove and replace	1	Ea	\$ 3,200.00	\$	3,200.00
	Metal doors and frames (double) - prime and paint	1	Ea	\$ 500.00	\$	500.00
	Replace roof membrane on all five buildings	1140	SF	\$ 30.00	\$	34,200.00
	Subtotal				\$	85,400.00
	Pavilion electrical repairs					
	Replace disconnects and distribution panels	1	Allow	\$ 25,000.00	\$	25,000.00
	Replace interior lighting and general purpose power	1	Allow	\$ 14,000.00) \$	14,000.00
	Subtotal				\$	39,000.00
	Security cameras, equipment and installation	2	Ea	\$ 25,000.00	\$	50,000.00
	Concrete sidewalk to stage elevation	470	SF	\$ 7.15	\$	3,370.00
	Grading and landscape restoration	1	Allow	\$ 1,000.00	\$	1,000.00
		SUBTOTAL (incl 0&P				188,770.00
		General Requirements (5%):				9,440.00
		Mobilization (3%):				5,670.00
		Contingency 15%:				18,880.00
		Budget:				222,760.00



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

BID ITEM NO.	Phase One Improvements; Sheet L200	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. O&P)		ESTIMATED AMOUNT
	PROMENADE IMPROVEMENTS					
	Demolish pavements, benches	200	CY	\$ 21.00	\$	4,200.00
	Remove trees	3	Ea	\$ 750.00	\$	2,250.00
	Pneumatic excavation under trees	120	CY	\$ 85.00	\$	10,200.00
	Unclassified excavation	180	CY	\$ 21.00	\$	3,780.00
	10" Perforated drain pipe	140	LF	\$ 21.50	\$	3,010.00
	Backfill drainage material	300	CY	\$ 35.00	\$	10,500.00
	10" Storm pipe	80	LF	\$ 23.50	\$	1,880.00
	Connect to existing storm system	1	Allow	\$ 600.00	\$	600.00
	Clean storm drainage system	1,100	LF	\$ 3.60	\$	3,960.00
	Repair seawall, parging deteriorated areas	1	Allow	\$ 30,000.00	\$	30,000.00
	Interpretive signage	1	Allow	\$ 5,000.00	\$	5,000.00
	Railing	162	LF	\$ 135.00	\$	21,870.00
	Stamped, integral color concrete promenade	4,400	SF	\$ 8.60	\$	37,840.00
	Concrete pavement	180	SF	\$ 7.15	\$	1,290.00
	Benches	6	Ea	\$ 1,600.00	\$	9,600.00
	Asphalt pavement, including excavation	4,500	SF	\$ 5.70	\$	25,650.00
	Landscape restoration	1	Allow	\$ 5,000.00	\$	5,000.00
		SUBTOTAL (incl O&P		_	176,630.00	
		General Requirements (5%): Mobilization (3%):				8,840.00 5,300.00
		Contingency 15%:			\$	17,670.00
			1	Budget	: \$	208,440.00



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

BID ITEM	Road Re-Alignment; Sheet L201	ESTIMATED	UNIT	UNIT PRICE (Incl.		ESTIMATED
NO.	Road Re-Alighment, Sheet L201	QUANTITY	UNII	O&P)		AMOUNT
					Ì	
	Demolish existing pavements, unclassified excavation	2,300	CY	\$ 21.00	\$	48,300.00
	Strip topsoil and stockpile	700	CY	\$ 14.00	\$	9,800.00
	Machine formed concrete curb	4,650	LF	\$ 6.55	\$	30,460.00
	City street pvmt, including excavation	50,200	SF	\$ 10.73	\$	538,650.00
	Drainage	1	Allow	\$ 45,000.00	\$	45,000.00
	Utility relocation	1	Allow	\$ 15,000.00	\$	15,000.00
	Directional, parking signage		Allow	\$ 5,000.00	\$	-
	Pavement striping		Allow	\$ 4,000.00	\$	-
	Landscape restoration	1	Allow	\$ 15,000.00	\$	15,000.00
	Stone parking lot, including excavation	5,000	SF	\$ 3.34	\$	16,700.00
	Boulders	50	Ea	\$ 200.00	\$	10,000.00
	New light standard incl. conduit and wire		Ea	\$ 3,500.00	\$	-
	Tree planting		Ea	\$ 400.00	\$	-
	ADD ALTERNATES (Not included in total below)				\perp	
	Granite curb in leiu of concrete curb	4,650	LF	\$ 33.45	\$	155,550.00
	Parking signage	1	Allow	\$ 5,000.00	\$	5,000.00
	Pavement striping	1	Allow	\$ 4,000.00	\$	4,000.00
	New light standard incl. conduit and wire	16	Ea	\$ 3,500.00		56,000.00
	Tree planting	34	Ea	\$ 400.00	\$	13,600.00
	Additional stone parking lot, including excavation	15,000	SF	\$ 3.34	\$	50,100.00
	SUBTOTAL OF ADD ALTERNATES				\$	284,250.00
	GC, Mob & Cont.				\$	51,165.00
	BUDGET FOR ADD ALTERNATES				\$	335,415.00
					_	
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					_	
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					+	
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) \$	728,910.00		
		General Requirements (5%):				36,450.00
		Mobilization (3%): Contingency 10%:				21,870.00
			_	72,900.00		
			-	Budget	. 3	860,130.00



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

Спеске	d/Approved By:				
BID ITEM NO.	Shoreline Trail Spur; Sheet L202	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. O&P)	ESTIMATED AMOUNT
	Asphalt pavement, including excavation	45,100	SF	\$ 5.70	\$ 257,070.00
	Trail pavement solid stripe	2,950	LF	\$ 1.25	\$ 3,690.00
	Trail pavement dashed stripe	2,950	LF	\$ 1.00	\$ 2,950.00
	Drainage	1	Allow	\$ 10,000.00	\$ 10,000.00
	Utility relocation	1	Allow	\$ 5,000.00	\$ 5,000.00
	Signage	1	Allow	\$ 3,200.00	\$ 3,200.00
	Pavement crosswalk striping	1	Allow	\$ 300.00	\$ 300.00
	Stone parking lot, including excavation	19,050	SF	\$ 3.34	\$ 63,630.00
	Landscape restoration	1	Allow	\$ 15,000.00	\$ 15,000.00
	Bollards	16	Ea	\$ 700.00	\$ 11,200.00
	Outfield fence	375	LF	\$ 44.00	\$ 16,500.00
	Tree planting	39	Ea	\$ 400.00	\$ 15,600.00
	Bike racks	4	Ea	\$ 800.00	\$ 3,200.00
	Boulders	30	Ea	\$ 200.00	\$ 6,000.00
L		<u> </u>		BTOTAL (incl O&P)	1.
		Ge	\$ 20,670.00 \$ 12,410.00 \$ 62,010.00		
				Budget:	300,430.00
		!	<u> </u>	-	



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

	d/Approved By:	I	!	1		
BID ITEM NO.	Waterfront Promenade; Sheet L203	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. O&P)		ESTIMATED AMOUNT
	Unclassified excavation to top of cribbing (1,425'x14'x8')	5,900	CY	\$ 19.00	\$	112,100.00
	Grout cribbing	1	Allow	\$ 60,000.00	\$	60,000.00
	Geotextile fabric	3,500	SY	\$ 2.70	\$	9,450.00
	10" Perforated drainage pipe	1,425	LF	\$ 23.50	\$	33,490.00
	Backfill drainage material	5,900	CY	\$ 35.00	\$	206,500.00
	Railing	1,425	LF	\$ 135.00	\$	192,380.00
	Stamped, integral color concrete promenade	21,400	SF	\$ 8.60	\$	184,040.00
	Landscape restoration	1	Allow	\$ 20,000.00	\$	20,000.00
	Benches	14	Ea	\$ 1,600.00	\$	22,400.00
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			,QI	IBTOTAL (incl O&P)	\$	840,360.00
		General Requirements (5%) Mobilization (3%)				42,020.00
						25,220.00
		Contingency 15%				126,060.00
				Budget:		1,033,660.00



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

Checke	d/Approved By:				
BID ITEM NO.	Pavilion Support Building; Sheet L204	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. 0&P)	ESTIMATED AMOUNT
	Pavilion support building	880	SF	\$ 200.00	\$ 176,000.00
	Sanitary sewer	410	LF	\$ 60.00	\$ 24,600.00
	Water	555	LF	\$ 40.00	\$ 22,200.00
	Water tap	1	Allow	\$ 1,500.00	\$ 1,500.00
	Road repair at crossing	1	Allow	\$ 2,700.00	\$ 2,700.00
	Electrical	1	Allow	\$ 3,500.00	\$ 3,500.00
	Concrete pavement	2,780	SF	\$ 7.15	\$ 19,880.00
	Concrete stair including cheekwall and railing	30	LFR	\$ 110.00	\$ 3,300.00
	Landscape restoration	1	Allow	\$ 6,000.00	\$ 6,000.00
			 		
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		1			1.
		_		JBTOTAL (incl O&P) quirements (5%):	
		J G€			
 		-	\$ 7,800.00		
-		Contingency 15%:			
			T	Budget:	φ 319,430.00
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Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

Спеске	d/Approved By:				
BID ITEM NO.	Promenade Enhancements; Sheet L205	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. 0&P)	ESTIMATED AMOUNT
	New light standard incl. conduit and wire	18	Ea	\$ 3,500.00	\$ 63,000.00
	Concrete pavement	27,000	SF	\$ 7.15	\$ 193,050.00
	Stamped, integral color concrete promenade	4,700	SF	\$ 8.60	\$ 40,420.00
	32-Foot shelter, Poligon or similar	1	Allow	\$ 80,000.00	\$ 80,000.00
	20-Foot shelter, Poligon or similar	1	Allow	\$ 53,000.00	\$ 53,000.00
	Benches	14	Ea	\$ 1,600.00	\$ 22,400.00
	Landscape restoration	1	Allow	\$ 20,000.00	\$ 20,000.00
	Tree planting	60	Ea	\$ 400.00	\$ 24,000.00
	Bike racks	4	Ea	\$ 800.00	\$ 3,200.00
			<u> </u>	1	†
					†
			 		
		1			1
		SUBTOTAL (incl O&P)			
		General Requirements (5%):			
		Mobilization (3%): \$			
ļ		Contingency 15%: Budget:			
			Ι	budget.	Ψ 013,060.00
L			<u> </u>		



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

BID ITEM NO.	Concession Area Improvements; Sheet L206	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. O&P)	ESTIMATED AMOUNT
	Strip topsoil and stockpile	300	CY	\$ 14.00	\$ 4,200.00
	Granite curb	144	LF	\$ 40.00	\$ 5,760.00
	City street pvmt, including excavation	1,420	SF	\$ 10.73	\$ 15,240.00
	Asphalt pavement, including excavation	1,100	SF	\$ 5.70	\$ 6,270.00
	Stone parking lot, including excavation	47,700	SF	\$ 3.34	\$ 159,320.00
	Concrete pavement	3,550	SF	\$ 7.15	\$ 25,390.00
	Landscape restoration	1	Allow	\$ 6,000.00	\$ 6,000.00
	Tree planting	31	Ea	\$ 400.00	\$ 12,400.00
	Bike racks	4	Ea	\$ 800.00	\$ 3,200.00
	Picnic tables	4	Ea	\$ 600.00	\$ 2,400.00
	Boulders	80	Ea	\$ 200.00	\$ 16,000.00
			 		
			<u> </u>		
		SUBTOTAL (incl O&P			
		General Requirements (5%)			
<u> </u>		Mobilization (3%):			
-		Contingency 15%:			
				Budget:	φ 515,110.00
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Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

Checke	Checked/Approved By:							
BID ITEM NO.	Walking Trails; Sheet L207	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. 0&P)	ESTIMATED AMOUNT			
	Stamped, integral color concrete	3,100	SF	\$ 8.60	\$ 26,660.00			
	Asphalt pavement, including excavation	16,450	SF	\$ 5.70	\$ 93,770.00			
	Crosswalk striping	3,450	LF	\$ 1.00	\$ 3,450.00			
	Crosswalk sign	5	Ea	\$ 300.00	\$ 1,500.00			
	Chain link fence	70	LF	\$ 44.00	\$ 3,080.00			
	Landscape restoration	1	Allow	\$ 10,000.00	\$ 10,000.00			
	Tree planting	61	Ea	\$ 400.00	\$ 24,400.00			
	Benches	8	Ea	\$ 1,600.00	\$ 12,800.00			
	Water bottle fill station	1	Ea	\$ 1,200.00	\$ 1,200.00			
	RPZ, backflow, hotbox & water piping to bottle fill	1	Allow	\$ 6,200.00	\$ 6,200.00			
	Boulders	60	Ea	\$ 200.00	\$ 12,000.00			
					†			
					 			
			SUBTOTAL (incl O&P)					
		General Requirements (5%): \$						
-			Contingency 15%: \$ Budget: \$					
				buuget.	\$ 239,940.00			
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Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

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BID ITEM NO.	Overlook; Sheet L208	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Incl. O&P)		STIMATED AMOUNT
	Note: Assumed that majority of fill material comes from other	park improvement	project e	xcavation	•	
	Asphalt pavement, including excavation	9,300	SF	\$ 5.70	\$	53,010.00
	Crosswalk striping	350	LF	\$ 1.00	\$	350.00
	Crosswalk sign	2	Ea	\$ 300.00	\$	600.00
	Rough grading, steep slopes	4,700	SY	\$ 1.00	\$	4,700.00
	Topsoil	525	CY	\$ 65.00	\$	34,130.00
	Fine grading, steep slopes	4,700	SY	\$ 2.16	\$	10,160.00
	Erosion control blankets	4,700	SY	\$ 4.20	\$	19,740.00
	Meadow seed mix	420	MSF	\$ 65.00	\$	27,300.00
	Landscape restoration	1	Allow	\$ 6,000.00	\$	6,000.00
	Tree planting	39	Ea	\$ 400.00	\$	15,600.00
	Artwork or sculptural elements	1	Allow	\$ 75,000.00	\$	75,000.00
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		SUBTOTAL (incl O&P)				246,590.00
		General Requirements (5%): \$ Mobilization (3%): \$				12,330.00
ļ						7,400.00
<u> </u>			C	Contingency 15%:	_	36,990.00
-				Budget:	\$	303,310.00
1						



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

BID ITEM NO.	Athletics; Sheet L209	ESTIMATED QUANTITY	UNIT	UN	IIT PRICE (Incl. O&P)		ESTIMATED AMOUNT
	Tree planting	51	Ea	\$	400.00	\$	20,400.00
	Granite curb	48	LF	\$	40.00	\$	1,920.00
	City street pvmt, including excavation	480	SF	\$	10.73	\$	5,160.00
	Stone parking lot, including excavation	10,000	SF	\$	3.34	\$	33,400.00
	Tee Ball Game Field						
	Backstop	1	Ea	\$	5,000.00	\$	5,000.00
	Chain link fence	118	LF	\$	44.00	\$	5,200.00
	Concrete pavement	200	SF	\$	7.15	\$	1,430.00
	Skinned home plate & bases, infield mix	600	SF	\$	4.40	\$	2,640.00
	15' Players bench	2	Ea	\$	1,000.00	\$	2,000.00
	Grading, topsoil, seed	16,000	SF	\$	0.50	\$	8,000.00
	Subtotal					\$	24,270.00
	Tee ball practice fields at old soccer location	1	Ea	\$	24,000.00	\$	24,000.00
	Demolish old backstops, fencing	1	Allow	\$	1,500.00	\$	1,500.00
	New full size soccer field						
	Strip topsoil and stockpile	650	CY	\$	14.00	\$	9,100.00
	4,840 l.f. 4" drain pipe, fitting, 12" connect to storm	1	Allow	\$	78,000.00	\$	78,000.00
	Rough grading	7,800	SY	\$	0.26	\$	2,030.00
	Amend soil	650	CY	\$	9.00	\$	5,850.00
	Place and fine grade soil	7,800	SY	\$	0.31	\$	2,420.00
	Sod	87,000	SF	\$	0.85	\$	73,950.00
	Goals	1	Pair	\$	4,200.00	\$	4,200.00
	15' Players bench	2	Ea	\$	1,000.00	\$	2,000.00
	12' High chain link fence	132	LF	\$	70.00	\$	9,240.00
	Subtotal					\$	186,790.00
	Renovate existing full size soccer field	1	Ea	\$	177,000.00	\$	177,000.00
	3-Row aluminum bleacher	8	Ea	\$	2,000.00	\$	16,000.00
	Miscellaneous chain link fence repairs	1	Allow	\$	12,000.00	\$	12,000.00
	Baseball diamond outfield fence	505	LF	\$	44.00	\$	22,220.00
	Boulders	32	Ea	\$	200.00	\$	6,400.00
		SUBTOTAL (incl O&P)		\$	531,060.00		
		General Requirements (5%): Mobilization (3%):					26,560.00
							15,940.00
					ingency 15%:		79,660.00
					Budget:	_	653,220.00



Project Title: LaSalle Park Design and Waterfront Access Project No.: 274760

Location: LaSalle Park Original Date: 07/05/17
Owner: City of Buffalo Revised Date: 07/27/17

Estimated by: AVT

BID ITEM NO.	Entry Garden; Sheet L211	ESTIMATED QUANTITY	UNIT	UNIT PRICE (Inc O&P)	l.	ESTIMATED AMOUNT
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	Stamped, integral color concrete	650	SF	\$ 8.60) \$	5,590.00
	Concrete pavement	550	SF	\$ 7.15	\$	3,940.00
	Asphalt pavement, including excavation	5,670	SF	\$ 5.70) \$	32,320.00
	Garden, loam soil, perennial and shrub plantings	3,900	SF	\$ 8.00) \$	31,200.00
	Landscape restoration	1	Allow	\$ 2,000.00) \$	2,000.00
	Tree planting	115	Ea	\$ 400.00) \$	46,000.00
	Boulder	20	Ea	\$ 200.00) \$	4,000.00
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					-	
			<u> </u>		-	
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					_	
		SUBTOTAL (incl O&P)) \$	125,050.00
		General Requirements (5%):				125,050.00
		Mobilization (3%):				3,760.00
		7	Contingency 15%:			18,760.00
				Budge		272,620.00
					T	

Appendices



Appendices A-02/13/2017 Meeting minutes





MEETING MINUTES

535 Washington Street, Suite 601

Buffalo, NY 14203

Phone: 716-688-0766

Fax: 716-625-6825

Wendel Project No. 274760

Project Title: LASALLE PARK DESIGN AND Meeting Date: February 13, 2017

WATERFRONT ACCESS

Location: Niagara Branch Library – 280 Porter Ave. Subject: LaSalle Park Steering Committee Mtg. #1

Attended?	Initials	Name	Company
	JG	Joanie Goldfarb	Admirals Walk Resident
	AG	Andy Graham	Harbor Pointe Resident
	KL	Kitty Lysiak	Rivermist
	FL	Frank Lysiak	Rivermist
	GH	George Haas	Gull Landing Resident
	SM	Sean Mulligan	Niagara District Council Rep.
	AR	Andy Rabb	City of Buffalo Parks (CoB)
	LM	Lynette Meyer	287 Lakefront
	MD	Michael Draganac	USACE Buffalo
	JK	Jerry Kelly	Buffalo Maritime Center
	JM	John Matague	Buffalo Maritime Center
	AT	Art Traver	Wendel – Project Landscape Architect
	DK	Dave Kenyon	Wendel – Project Manager - Landscape Architect
	DG	Dean Gowen	Wendel – Principal in Charge - Landscape Architect

Item	Ball in Court	Description	Status	Started	Due
					1

TOPICS DISCUSSED:

- 1. Andy Rabb (AR) made opening remarks outlining series of milestones leading up to this project, the project's scope and objectives. The project will involve analysis and design concepts for improvements to the south end of LaSalle Park and associated sea wall and sea plane ramp area.
- 2. Andy introduced Michael Draganac (MD) US Army Corps of Engineers. Mike reviewed the scope and general findings of the USACE study and the pending project to repair the sea wall at the north end of the park in front of the Colonel Ward Pump Station.
 - a) USACE sea wall project awaiting final signatures from City before commencing with design.
 - b) 65% Federal Funding with 35% local match (City of Buffalo)
 - c) 2019 construction anticipated but could extend into 2020 to complete.
 - d) Project will coordinate amenities; railing, benches, etc. Wave damage and deflection a concern.
 - e) Docking along main sea wall will be discouraged given the proximity of designated shipping lane.
- 3. AR introduced Dean Gowen (DG). Dean shared his history and knowledge regarding the most recent Master Plan. Dean made it clear this meeting was to solicit input to help guide the development of three (3) Improvement Plan Alternatives to be vetted with the committees and other stakeholders as identified by CoB.
 - a) Reviewed reasoning behind Master Plan improvements at the south end of LaSalle Park.
 - b) CoB Police preferred the cul-de-sac concept as it gave them greater control over traffic entering and exiting the park.
 - c) DG then opened up the meeting to soliciting input from LaSalle Park Steering Committee members.
- 4. Joanie Goldfarb (JF) expressed concern regarding garbage in the park. City totes get blown over or blown open and garbage gets strewn throughout the park. Visitors in cars toss garbage from cars rather than get out and place in totes. Possibly create a program to discourage, maintain and enforce littering concerns. Park Ranger? Hutch Tech Students?
- 5. John Montague (JM) shared remarks regarding Buffalo Maritime Center's (BMC) desire to develop the sea plane area of the park into a home for a proposed Buffalo Maritime Center.
 - a) BMC originally had a home at Buffalo State's Great Lakes Lab Building. BMC looking to develop a permanent home for the Maritime center and related activities.
 - b) There is a desire to create improved access to the water's edge and facilitate educational boat building and launching from sea plan ramp area.
 - c) Possibly develop ferry connection to the observation tower; bike ferry.

- d) Possibly step down sea wall to allow access to floating docks.
- A comment was made that perhaps a berm or buffer could be created along the 190. AR remarked that there was once a
 berm in the vicinity of the 190 but was removed to alleviate poor drainage. Other buffering means and methods could be
 entertained.
- 7. There was much discussion around the need to clean driftwood and debris out of sea plane ramp area. AR remarked that this is performed once per year (Spring) by CoB contractor.
 - a) A stable accessible route will need to me maintained to allow for debris removal equipment; crane, trucks, etc.
 - b) Debris removal program means and methods will need to be coordinated with USACE, CoB and US Coast Guard.
 - c) AR stated that the LaSalle Park sea wall is not cleared of debris more frequently because it is not currently designated a waterfront access point.
- 8. There was discussion about possibly creating restrooms at the south end of the park. Security, vandalism and maintenance are concerns that would need to be considered if restrooms were to be incorporated into park improvements.
- 9. LaSalle Park Improvements should cater to walkers, joggers, cyclists, fisherman, etc.
- 10. Andy Graham (AG) spoke to several issues given his familiarity with boating and historic use of the sea plane ramp.
 - a) Sea plane ramp area once welcomed small sail boats, canoes, kayaks and fishing.
 - b) Ramp serves as a key emergency access point that should be maintained and enhanced.
 - c) Underwater recovery training occurs at the ramp area.
 - d) Ramp is "hollow" and structural evaluation should be performed.
 - e) Paved access to ramp should be provided.
 - f) Suggests "rules of the road" signage relative to small watercraft.
 - g) Possibly incorporate debris deflector chevrons or similar at ramp.
 - h) Incorporate buoys with speed limit posted to protect smaller watercraft.
 - i) Would it be possible to incorporate swimming into programming for ramp area?
- 11. Frank Lysiak (FL) expressed concerns that with all the discussion involving the sea wall, sea plane ramp and water activities, he hopes we don't lose focus on upland park improvements. In his view, this should be considered a major regional park rather than a community park.
- 12. Work has been done to existing concessions building. CoB is actively pursuing a vendor agreement to operate the concessions building.
- 13. Kick ball league currently uses lawn area at sea plane ramp.
- 14. Proposed improvements should be sensitive to the needs of existing festivals and events; within reason.
- 15. Additional comments received via email as of 3/6/17:
 - a. Improve condition of park road and pathway pavements.
 - b. Consider how to better accommodate various festivals and events.
 - c. Need to solicit input from a broader more diverse audience of park users and community members.
 - d. Capitalize on views within the park.
 - e. Provide greater accessibility to the shoreline/water's edge.
 - f. Some existing park benches are in need of repair or replacement.
 - g. Soil issues and exposed tree roots need to be addressed.
- 16. Per the agreement between CoB and Wendel the scope for this project is broken into three (3) phases:
 - Phase 1 Pre-Design, Scoping & Programming (Site analysis, research, meet with stakeholders and generate three (3) alternative concepts to be generated for review and comment)
 Targeting First week of April for Public Meeting #1
 - Phase 2 Schematic Design (Preferred concept will be advanced as well as related analysis and estimates)
 - <u>Phase 3</u> Design Development (Preferred concept and estimate will be further advanced identifying potential phasing to help facilitate grant applications to fund construction documents and subsequent construction)

It is expected that Phases 1 through 3 as outlined above will be accomplished over the course of approximately 12 weeks.

The above minutes represent Wendel's understanding of the major topics discussed. Please provide any additions/deletions to the undersigned within 5 business days of receipt.

| Property By: | Wendel |

Prepared By:	Wellder		
Signed:	Chanil Kenny	Dated:	3/7/17

Appendices B - 04/25/2017 Meeting minutes





For Review

05/01/2017 12:43:49 PM

Meeting Date:

April 25th, 2017

MEETING MINUTES

 535 Washington Street, Suite 601
 Phone:
 716-688-0766
 No. 002

 Buffalo, NY 14203
 Fax:
 716-625-6825
 Wendel Project No.
 274760

Project Title: LASALLE PARK DESIGN AND

WATERFRONT ACCESS

Location: Niagara Branch Library – 280 Porter Ave. Subject: Public Meeting #1

Initials	Presenter's Name	Company
AT	Art Traver	Wendel - Project Landscape Architect
DK	Dave Kenyon	Wendel - Project Manager - Landscape Architect
DG	Dean Gowen	Wendel - Principal in Charge - Landscape Architect
AR	Andy Rabb	City of Buffalo Parks

TOPICS DISCUSSED: (Refer to Attached Presentation)

- 1. Andy Rabb (AR) made opening remarks outlining series of milestones leading up to this project, the project's scope and objectives. The project will involve analysis and design concepts for improvements to the south end of LaSalle Park and associated sea wall and sea plane ramp area.
- 2. Andy introduced Art Traver; Project Landscape Architect from Wendel (AT)
- 3. AT reviewed project scope, directives and schedule. Project focuses on inventory, analysis and potential improvements at the south end of LaSalle Park.
- 4. Dean Gowen (DG) mentioned his role in having produced the 2000 Master Plan.
- 5. DG presented three concepts and vehicular related parking and circulation. The caveat was added that none of these concepts are final or "engraved in stone". They are merely ideas aimed at obtaining a reaction and feedback.
- 6. Comments:
 - a. Keep cars away from playground area at south end. Inconsiderate drivers create safety issues.
 - b. Andy Rabb mentioned we need to main vehicular access to the south end of the park for kayak transport, picnic shelter access.
 - c. Measures will be taken to calm traffic. Recently installed speed bumps work well. Narrow more serpentine roads would help slow traffic and mitigate racetrack effect.
 - d. Revetment treatment in "lagoon" needs to take into account lake surges and/or seiches.
 - e. Existing sea wall built on wood cribbing which is deteriorating. Water surges below and releases like geysers from behind wall.
 - f. Focusing parking in specific areas rather than along roadways and sea wall is preferred.
 - g. Need for police buy-in on proposed circulation and parking concepts.
 - h. Andy Rabb announced that it is likely that additional security cameras will be added in strategic locations.
 - i. More people accessing and present in the park will theoretically aid in security and safety.
 - j. LaSalle Park is currently open 24 hours to accommodate fishing activities. Changing park hours will require an amendment to the City Ordinance and City Charter.
 - k. Audience likes the idea of pulling vehicular traffic away from the waterfront to the greatest extent possible in favor of developing a more pedestrian friendly setting.
 - l. There is a desire to include water fountains for people, not just dogs. Andy Rabb mentioned that this would involve relatively expensive infrastructure to insure water quality safety. Wendel will look at opportunities to incorporate "bottle fillers" at strategic locations. Request for one by Skate Park and one by Playground.
 - m. Need to remedy garbage totes blowing over and trash being strewn throughout the park. Possibly incorporate "tote hooks" similar to those implemented along Cape Cod Canal.

- n. Can boats potentially be docked along park sea wall? The navigational channel abuts the sea wall along the south end of the park and water level is approximately 9 feet below the Riverwalk, making access problematic.
- o. Need to incorporate emergency ladders along sea wall. This will be part of Army Corp of Engineers sea wall project, if feasible.
- p. It would be nice if boaters could access and appreciate park from the water.
- q. There was a suggestion to reference potential "Belt Line" connection potential along east edge of park.
- r. It was suggested that bike racks be added at strategic points within the park.
- s. The concern was raised about hypodermic needles strewn about park. Andy Rabb asked that park patron call 311 rather than handling or disposing of needles.
- t. Interpretive sign(s) shall be incorporated narrating the history of LaSalle Park.
- u. It would be nice if more winter activities could be programmed within the park.
- v. Concept should consider and show proposed walking paths within the park and how they would relate to existing paths.
- w. Andy Rabb mentioned that the City was successful in acquiring a grant from the Niagara River Greenway Commission to help fund the first phase of improvements for this project.
- 7. Per the agreement between City of Buffalo and Wendel the scope for this project is broken into three (3) phases:
 - <u>Phase 1</u> Pre-Design, Scoping & Programming (Site analysis, research, meet with stakeholders and generate three (3) alternative concepts to be generated for review and comment) Complete April 25, 2017
 - Phase 2 Schematic Design (Preferred concept and Estimate) End of May 2017
 - <u>Phase 3</u> Design Development (Preferred concept and estimate will be further advanced identifying potential phasing to help facilitate grant applications to fund construction documents and subsequent construction)

 End of June 2017

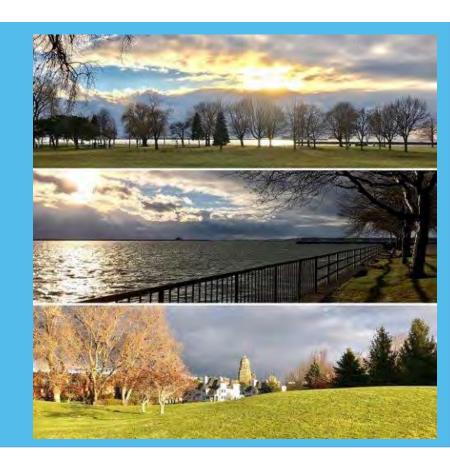
The above minutes represent Wendel's understanding of the major topics discussed. Please provide any additions/deletions to the undersigned within 5 business days of receipt.

Prepared By:	Wendel		
Signed:	Ham Keng	Dated:	4/28//17

LaSalle Park Design & Waterfront Access

Public Information Meeting

Niagara Branch Library April 25, 2017 6:00pm







Project focus area





1998 Master Plan, Revised July 2000





Project Outline

- Site Analysis
 - o 80% complete
- Develop three alternative concepts complete
- o 1st Public meeting, review concepts, receive input tonight
- o 2nd Public meeting to present and review preferred alternative
 - Approximately the third week in May
- Advance design plans, phasing options and cost estimates
 - End of June



Pavilion

- Tensile structure and supports appears in good condition, some tears require repair
- Fabric has approximately 10 more years
- Rigging grid requires additional survey, appears OK
- Exterior of larger structure, cosmetic cracking
- Metal roof deck generally sound, but areas of corrosion
- Electrical requires renovation
- Stage area has substantial settling
- Lacks ADA accessibility









Concession Building

- Exterior in fair condition, some brick repointing needed
- Wood fascia not replaced as part of recent roofing project, needs replacement
- Mechanical and electrical recently updated
- Some minor interior wall patching required
- Restrooms in good condition, minor updates
- Paving around building in need of replacement
- Tenant-ready with little of no further build-out









Roads and Pathways

- Majority of roads have been recently reconstructed and are in excellent to good condition.
- Road along waterfront in need of repair
- Waterfront trail generally in fair condition
- Smaller interior trails have reached useful life
- Parking areas are in serviceable condition









Athletics

- Baseball and softball;
 - turf and skinned infields good,
 - o fence framing generally good
 - o fence fabric needs repair,
 - o several bleachers need.
- o Soccer;
 - o goals & nets in good/fair condition,
 - o turf in need of renovation.









Amenities

- Playground equipment in good condition
 - Raised border collects leaves and trash
- Benches are functional
- Shelters, including picnic benches and grills, in excellent condition









Shoreline

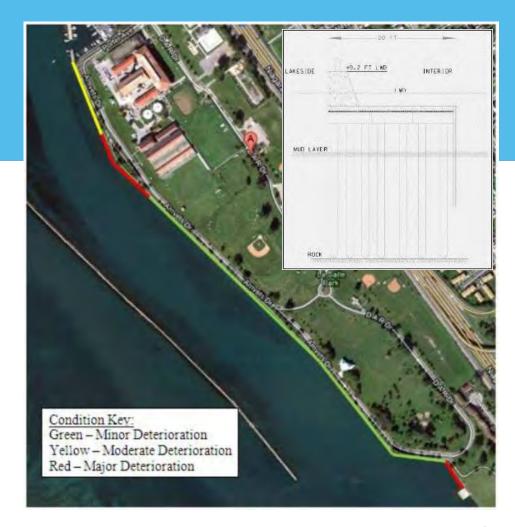
- Railing is adequate as pedestrian access not immediately adjacent
- Benches are functional
- Washouts and sinkholes require filling
- Seaplane ramp topping concrete eroded and structural steel exposed, requires further investigation
- Deposited debris requires maintenance to remove





Seawall (ACOE)

- Majority of seawall within project area was found to have minor deterioration
- Northern portion of wall near pumping station is planned for repair
- Southern portion of wall near seaplane ramp was found to have major deterioration. This area has the most washouts and/or sinkholes that require annual maintenance





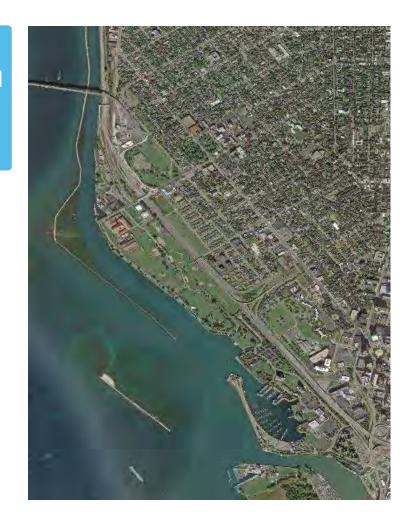
Issues

- Vehicular traffic along waterfront, barrier to pedestrians, excessive speed
- o Lack of minor (pedestrian only) pathways, purposeful connections or function
- Access to water and/or waterfront
- Lack of naturalized landscapes / excessive mowing
- Pavilion not meeting needs of users
- Cleaning of debris at seaplane ramp is difficult and requires heavy equipment
- Parking during peak usage
- Requirement to maintain emergency access through park and to neighborhood



Questions, Suggestions and Comments Received

- Can something be done about the garbage in the park
- Improve the roadways
- Car top boat launch, kayak/canoe
- Ferry connection to marina
- Buffer along I-190
- Concern about vandalism if additional restroom constructed
- Keep seaplane ramp for emergency access/training
- Debris deflector
- Focus on upland portions of park
- Consider festivals and events that use pavilion
- Buffalo Maritime Center?

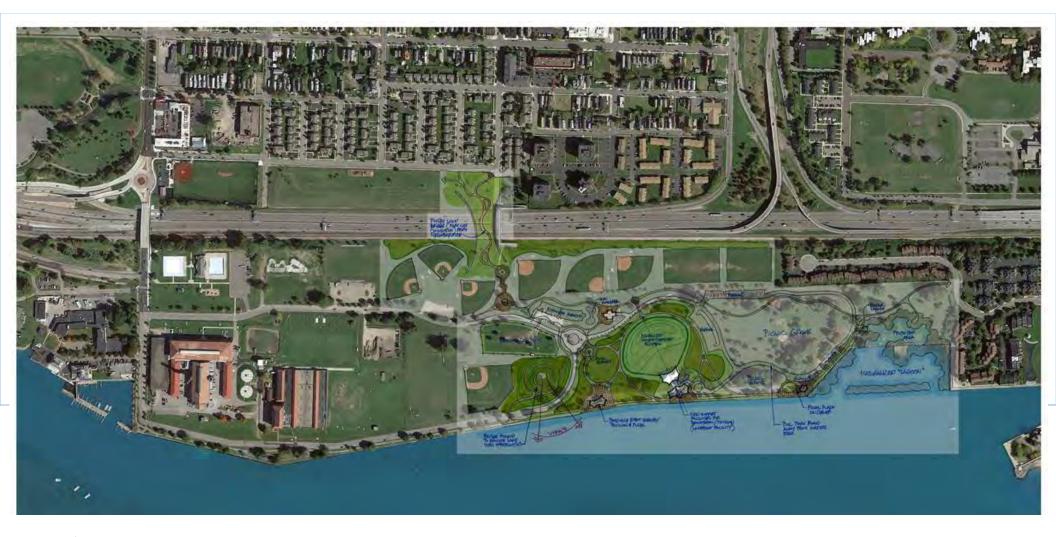




Opportunities

- Relocate / limit vehicular traffic along waterfront
- Define and consolidate parking areas
- o Continue 12-foot wide shoreline trail 'off-road' through park
- Provide pedestrian pathways with purposeful connections
- Provide plaza at concession stand
- Reduce mowing, create naturalized or habitat areas
- Capitalize on lake views and interior park views
- Create waterfront experience
- Provide access to water
- o Remove or protect existing seawall near seaplane ramp
- Explore options for connection to Hudson and 4th St Park
- Explore options for pavilion to meet needs of users









Concept A

- o Land bridge
- o Entry plaza
- o Dog park remains





Concept A

- o Enhanced lake views
- Remove vehicles from waterfront
- o Define parking
- Waterfront plazas
- o Support facility for pavilion
- o Enhance amphitheater lawn
- o Plaza at concessions
- o Naturalized areas

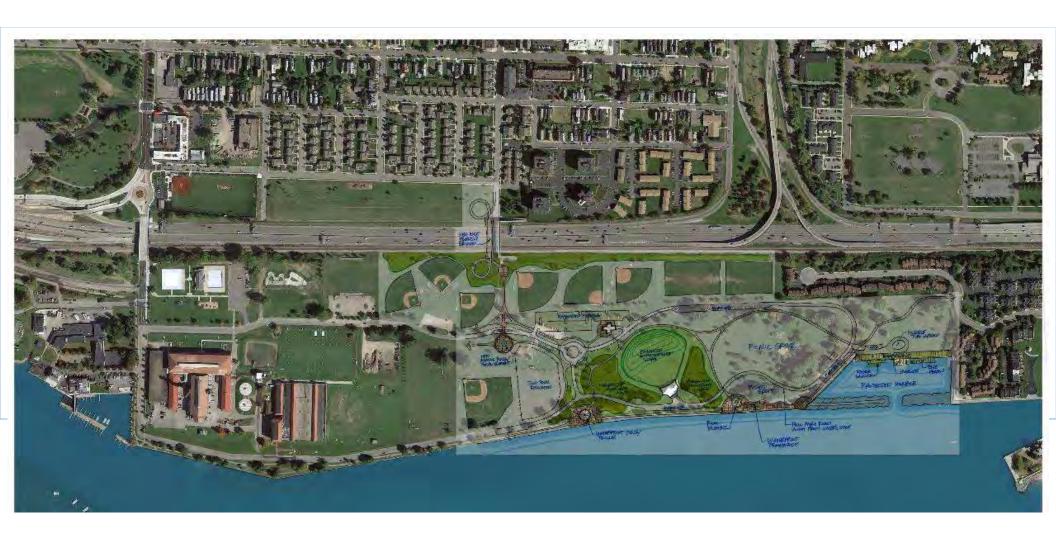




Concept A

- o Large cul-de-sac
- o Defined parking
- o Re-work soccer parking
- o Continue wider shoreline trail
- o Create lagoon
- o Cartop launch
- Relocate existing picnic shelters









Concept B

- o New bridge
- o Entry plaza
- o Arrival plaza, focal element
- o Defined parking
- o Plaza at concessions
- o Dog park reconfigured





Concept B

- o Waterfront plaza / pavilion
- Remove vehicles from portions of waterfront
- Support facility for pavilion under tensile structure
- o Enhance amphitheater lawn
- o Plaza at concessions
- o Walking trails
- o Naturalized areas





Concept B

- o Loop road remains
- o Defined parking
- o Continue wider shoreline trail
- o Create "harbor"
- o Boardwalk
- o Cartop launch
- Relocate existing picnic shelters
- o Waterfront promenade









- o Pedestrian bridge remains
- o Expand / define parking
- o Plaza at concessions
- o Dog park remains





- o Pedestrian bridge remains
- Remove vehicles from waterfront
- o Large waterfront plaza
- o Expand / define parking
- o Plaza at concessions
- o Naturalized areas
- o Dog park slight shift





- Remove vehicles from waterfront
- o Major waterfront promenade
- o Support facility for pavilion
- o Enhance amphitheater lawn
- o Expand / define parking
- o Re-orient soccer
- o Naturalized areas





- o Continue wider shoreline trail
- o Protected "harbor"
- o Seaplane ramp remains



Questions

Andy Rabb Deputy Commissioner Department of Public Works, Parks & Streets arabb@city-buffalo.com



Appendices C - 06/08/2017 Meeting minutes





MEETING MINUTES

535 Washington Street, Suite 601

Buffalo, NY 14203

Phone: 716-688-0766

Fax: 716-625-6825

Wendel Project No. 274760

Project Title: LASALLE PARK DESIGN AND Meeting Date: June 8th 2017

WATERFRONT ACCESS

Location: *Niagara Branch Library – 280 Porter Ave.* Subject: Public Meeting #2

Preferred Concept Presentation

Presenter's Name	Company
Art Traver	Wendel – Project Landscape Architect
Dave Kenyon	Wendel – Project Manager - Landscape Architect
Dean Gowen	Wendel – Principal in Charge - Landscape Architect
Andy Rabb	City of Buffalo Parks

Attendee's Name	Affiliation
Renata Kraft	BN Riverkeeper
Andy Graham	Harbour Pointe
Joanie Goldfarb	Admirals Walk Resident
Joan Light	102 Gull Landing
Jack Brodzik	426 Lakefront Blvd.
Brian Germann	426 Lakefront Blvd.
Bob Drajem	295 Lakefront-Breakwaters
Maureen & Gerry Glose	18 Harbour Pointe
Karen Drzmala	356 Lakefront Commons
Ken Drzymala	356 Lakefront Commons
Mary Eisinger	378 Lakefront Commons
Kris Schleiermacher	345 Porter Ave
Nadine Morrero	City of Buffalo
Peter Brummer	Pasquale
Barbara Rowe	Vision Niagara
Peter Sowiski	Vision Niagara

TOPICS DISCUSSED: (Refer to Attached Presentation)

- 1. Andy Rabb made opening remarks outlining the milestones leading up to this meeting, previous public meetings, comments received and evolution of concepts leading to presentation of "Preferred Concept" at this meeting.
- 2. Andy introduced Art Traver; Project Landscape Architect from Wendel
- 3. Mr. Traver reviewed this meetings objectives as outlined in the attached presentation. Project focuses on inventory, analysis and potential improvements at the south end of LaSalle Park.
- 4. Mr. Traver reviewed the history of the park, improvements over the many decades and evolution of 1998-2000 Master Plan.
- 5. Mr. Rabb interjected that relative to the 2000 Master Plan, the City of Buffalo has invested millions of dollars in improvements to LaSalle Park since 2004. Most improvements have been consistent and were inspired by the 2000 Master Plan, even though many of the improvements were not graphically depicted on the Master Plan; like fencing, bleachers, backstops and other amenities and infrastructure.
- 6. Mr. Traver reviewed previous Concepts A, B and C as shared at 4/25/17 Public meeting as well as the comments received prior to this meeting. (See attached presentation).

- 7. Mr. Traver presented the "Preferred Concept" Plan resulting from comments received to date. He went on to clarify that many of the preferred specific improvements are not graphically depicted on the "Preferred Concept Plan" but are considered part of the Preferred Plan. Improvements like fencing, bleachers, as well as renovations to the concessions building and soccer fields.
- 8. Comments on Preferred Concept:
 - a. A clearly defined and designated bike route needs to be incorporated to permit efficient and safe movement of cyclists through the park.
 - b. Clearly defined and designated pedestrian paths need to be incorporated allowing and encouraging pedestrian movement throughout park.
 - c. Mr. Rabb initiated discussion about preference for pull-up and drop-off lane at kayak launch area. Parking could possibly be accommodated along inside edge of one-way roadway at this location.
 - d. Concern was raised regarding realignment of narrow one-way park road in relatively close proximity to the existing playground and proposed picnic grove. Response was that due to the narrower, serpentine one-way road with seasonal speed bumps, and caution signage should help mitigate speeding and promote safety.
 - e. Proposed improvements need to be sensitive to site lighting, safety and security to the greatest extent feasible.
 - f. There was much discussion about "cove" area including potential use of existing sea plane ramp, deteriorated sea walls, proposed kayak launch and revetment wall.
 - Structural testing of the concrete sea plane ramp will be facilitated by Wendel to help inform potential repairs and future uses.
 - Concern about garbage and debris collecting in proposed armor stone in front of sea wall in cove area.
 - Perhaps better "naturalize" some shoreline within the cove area incorporating erosion control plantings as well as providing access points for users to touch the lake and experience nature close up.
 - Andy Rabb mention that possibly eliminating 90 degree pocket in cove would help with debris collection.
 - Monies may be better invested in an improved sea wall treatment in the cove area rather than on expensive revetment wall.
 - Novice kayakers like the idea of a protected cove providing a safer launch experience.
- 9. Per the agreement between City of Buffalo and Wendel the scope for this project is broken into three (3) phases:
 - <u>Phase 1</u> Pre-Design, Scoping & Programming (Site analysis, research, meet with stakeholders and generate three (3) alternative concepts to be generated for review and comment) Complete April 25, 2017
 - Phase 2 Schematic Design (Preferred concept) Completed June 8 2017
 - <u>Phase 3</u> Design Development (Preferred concept and estimate will be further advanced identifying potential phasing to help facilitate grant applications to fund construction documents and subsequent construction)

 <u>Mid July 2017</u>

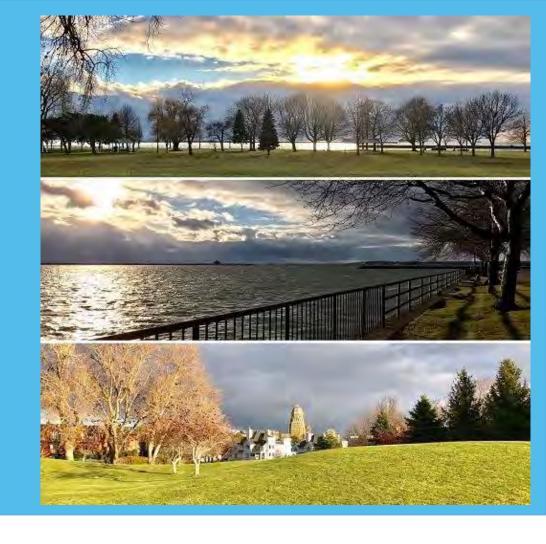
The above minutes represent Wendel's understanding of the major topics discussed. Please provide any additions/deletions to the undersigned within 5 business days of receipt.

Prepared By:	Wendel		
Signed:	Banil Keng	Dated:	6/12//17

LaSalle Park Design & Waterfront Access

Preferred Concept Presentation

Niagara Branch Library June 8, 2017 6:00pm



Agenda

- Project outline
- Review three alternative concepts presented at last meeting
- Present comments received on concepts
- Present and review preferred alternative
- Comments / discussion



Project Outline

- Site Analysis complete
- Develop three alternative concepts complete
- o 1st Public meeting, review concepts, receive input complete
- o 2nd Public meeting to present and review preferred alternative tonight
- Advance design plans, phasing options and cost estimates
 - End of June





Existing Conditions 1927



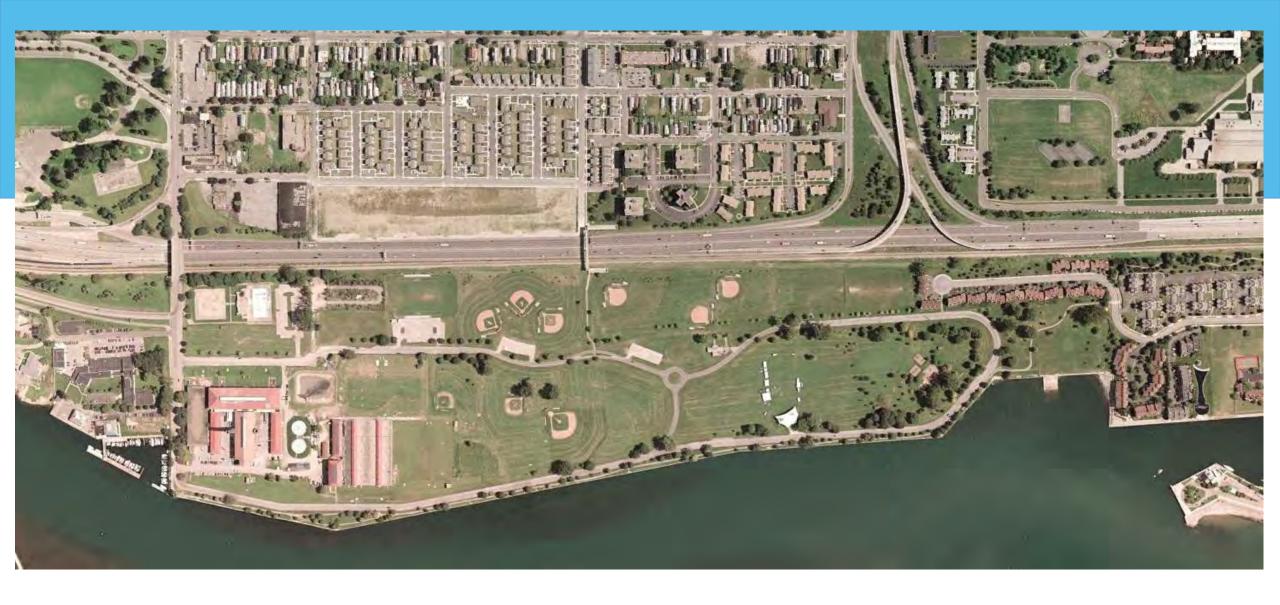




Existing Conditions 1995

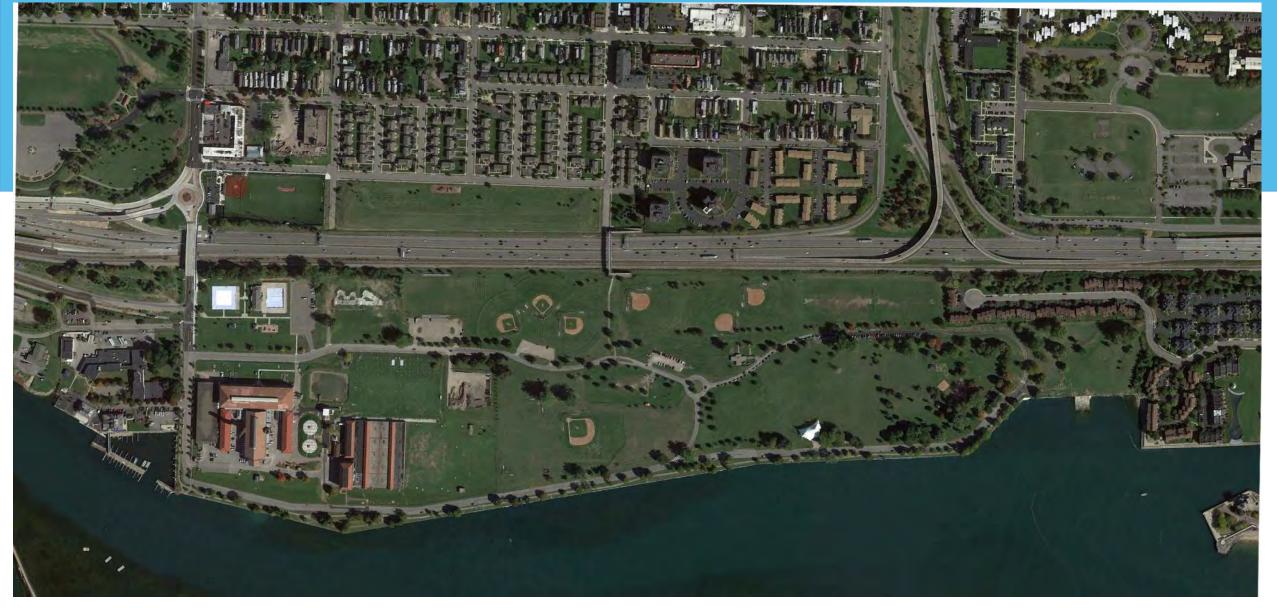






Existing Conditions 2004







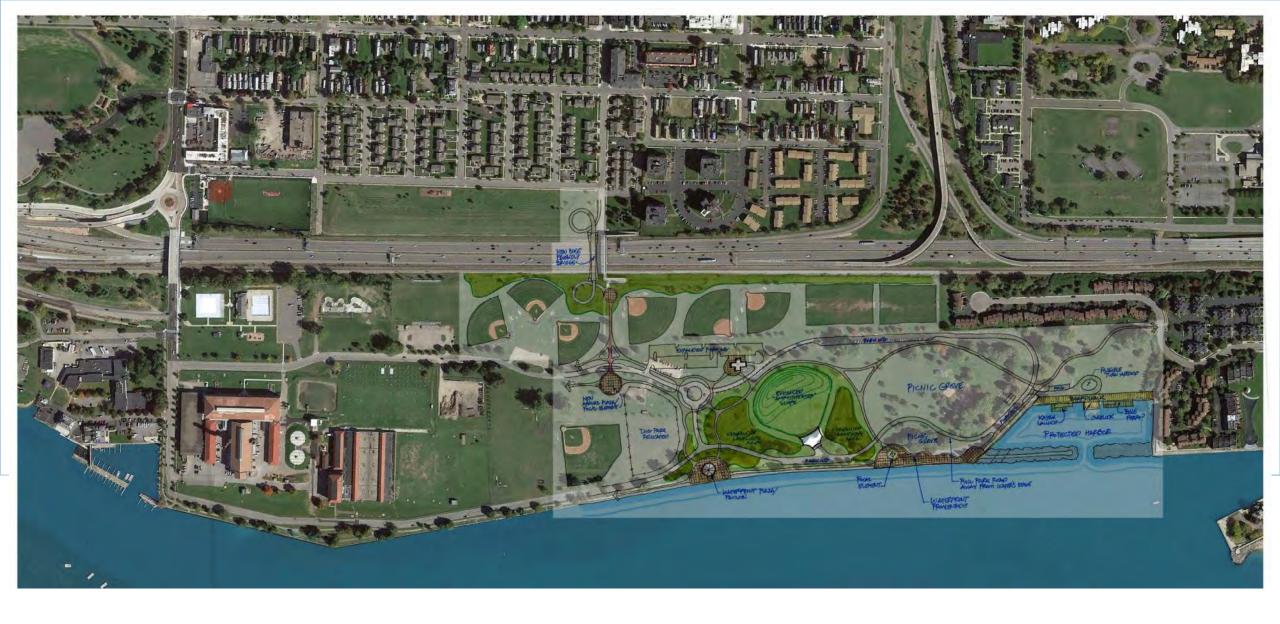
Existing Conditions 2016

















Unfavorable

- Land bridge
 - Too costly
 - Provides ATV/motorcycle access
- Additional parking or roads at south end
- Parking lots in general
- Removing seaplane ramp, it's history
- Breakwater at seaplane 'cove'
 - Too costly
 - Will trap debris
- Moving road away from water
 - Provides a barrier between playground and water

Concept Comments



Favorable

- Raised mound / elevated viewing point
- Kayak or car top boat launch
- Naturalized shoreline
- Lagoon or harbor
- Move vehicles away from waterfront
- Defined parking
- Bike friendly bridge
- Naturalized or habitat areas
- Full size soccer
- Keeping seaplane ramp
- Performance building
 - Green room, restrooms, dressing rooms
- New street lights

Concept Comments



Other elements included in the improvements

- Pavilion
 - Electrical renovation
 - Roof and exterior wall repair
 - Replace doors
- Accessible route to stage
- Concession building
 - Fascia repair
 - Brick repointing
- Fence repair for ball diamonds
- Bleacher replacement
- Soccer field soil/turf renovation
- Bottle filling station(s)
- Benches

























Preferred Concept (Dog Park Option)





Questions

Andy Rabb Deputy Commissioner Department of Public Works, Parks & Streets arabb@city-buffalo.com



Appendices D - Concept A





Appendices E - Concept B





Appendices F - Concept C





Appendices G-Preferred Concept





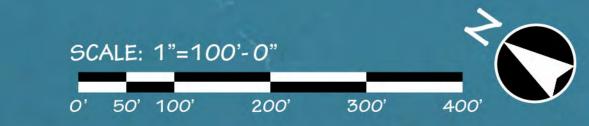
LASALLE PARK MASTER PLAN UPDATE

South Section of the Park

PREFERRED CONCEPT







Appendices H – Seaplane Ramp Testing Analysis





November 10, 2017

Mr. Arthur Traver III Wendel WD Architecture, Engineering, Surveying, and Landscape Architecture, P.C. 375 Essjay Road, Suite 200 Williamsville, NY 14221

Re: LaSalle Park Lake Ramp Evaluation Ryan Biggs | Clark Davis Project 11833

Dear Arthur:

At your request, I made a site visit on September 21, 2017 to perform a condition assessment of an existing concrete ramp on the east shore of Lake Erie at LaSalle Park in Buffalo, New York. The ramp was reportedly built to facilitate seaplanes entering and exiting the lake and was constructed in the 1920s. The ramp is showing signs of severe deterioration, and visible surfaces exhibit spalled concrete and exposed reinforcement.

We were met on site by the RJR Engineering, P.C. coring crew, who was on site to take concrete cores at various locations as directed by Ryan Biggs | Clark Davis.



Photograph 1

Introduction

The ramp is located at the south end of LaSalle Park. LaSalle Park is located on the eastern shore of Lake Erie, just south of the Niagara river outlet.

The ramp runs west into the lake and is approximately 75 feet wide. The visible portion of the ramp above the water line is approximately 63 feet long. The ramp continues into and below the water line, but the full length and depth was not verified.

The ramp appears to have been constructed as a monolithic reinforced concrete structure. No existing drawings are available for the structure, and the exact time of construction is unknown. It is believed that the structure was built in the 1920s.

Beyond visual assessment, a total of 3 cores were taken for analysis and testing. Compressive strength testing was performed on 1 of the cores, and petrographic analysis was performed on the other 2 cores. The results of the testing are summarized in the testing section of this report.

Observations

Observations were performed from the top surface of the ramp and from the adjacent sea walls. No observations were performed from the water surface or below the water level.

Overall, the ramp is significantly deteriorated across all exposed surfaces visible above the water line. The top of the ramp surface has significant spalling and exposed reinforcing, and the reinforcing is bent and displaced at many locations. See Photographs 2 and 3.





Photograph 2

Photograph 3

The ramp was originally constructed with shallow stairs along the north and south edges of the ramp. The stairs were measured at approximately 10 feet wide. These stairs have largely deteriorated and are only visible at the top of the ramp on the south side. See Photograph 1 above.

Exposed reinforcement is 3/4 inch in diameter at all locations measured. The reinforcing is spaced at approximately 6 inches on-center in each direction over the majority of the ramp. In general, the reinforcing is rusted, but no significant section loss was observed. See Photograph 4.



Photograph 4

At the north and south walls, the top ends of the vertical reinforcing were visible. This reinforcing appeared to be spaced at 12 inches on-center going down the length of the ramp (east/west direction). There appeared to be three lines of vertical reinforcing bars spaced at approximately 12 inches on-center. The thickness of the wall appeared to be approximately 3 feet. See Photographs 5 and 6.







Photograph 6

There is an approximately 10-foot-wide strip of the ramp located approximately 30 feet from the north wall that has no visible top reinforcing running down the length of the ramp (east/west direction). At this location, reinforcing was observed running in the north/south direction across the ramp at approximately 12 inches on-center. See Photograph 7. Every other bar from the mats to the north and south, which were spaced at 6 inches on-center, are discontinued leaving the remaining bars at a 12-inch spacing (see Photograph 8). Vertical bars were observed in this strip and are spaced at roughly 6 inches on-center across the ramp (north/south direction) and 16 inches on-center down the length of the ramp. This could be an indication of a vertical support such as a wall, below the ramp in this area.



Four rows of steel pipes were observed embedded in the concrete near the center of the ramp. They are oriented in lines running down the length of the ramp (east/west direction). The pipes are approximately 4 inches in diameter and have been cut off at or just below the top of the ramp surface. The rows of pipe are spaced approximately 9 feet on-center in the north/south direction and 10 feet on-center in the east/west direction. There are approximately 28 pipes total. It is not clear what purpose these pipes served.



Photograph 9

At one location, there is a hole that extends through the entire thickness of the ramp deck. It is unclear what the purpose of this hole might have been. It is possible that the hole was inadvertently created as a result of the original formwork. A tape measure was extended through the hole a significant distance (up to 17 feet) and no bottom or grade was verified below the ramp deck. The tape did not appear to be wet when it was withdrawn from the hole, and it did not appear to make contact with any obstructions below the ramp slab. This could be an indication that there is vault space below portions of the ramp, and these spaces may be dry or partially dry below the surrounding Lake Erie water line. It also indicates that portions of the ramp slab are not continuously supported and the ramp is a structural slab. The ramp deck was measured to be 1 foot 5 inches in thickness at the hole, but the top surface has significant spalling, so the total original thickness could not be determined.



Photograph 10

A total of four steel cleats were observed; two at the north and two at the south sides of the ramp. Two raised areas of concrete were also observed; one at the north and one at the south side of the ramp. These locations each had four large anchor bolts that appeared to have been cut off. These items were likely anchorages of some kind. See Photographs 11 and 12.



Photograph 11 Photograph 12

Overall, the ramp as whole appeared to be intact and has not experienced visible settlement or listing.

Testing

Three concrete core samples were obtained during our observations for compressive strength testing and petrographic analysis. The locations were determined by Ryan Biggs | Clark Davis. Compressive strength testing was performed by RJR Engineering, P.C. on one core sample. This core was taken near the top of the ramp at the north side, and the results are presented in the attached Appendix A.

Petrographic analysis was performed by American Petrographic Services (APS), Inc. on two of the concrete core samples. One sample was taken near the water's edge and the other near the top of the ramp near the south side. The sample taken near the water's edge had one horizontal crack but was otherwise intact. The sample taken near the top of the ramp was highly fractured and in poor condition. These samples were tested for hardened air content, depth of carbonation, and water-soluble chlorides at incremental depths from the concrete surface. The results of the testing are attached to this report in Appendix B and are summarized below.

Compressive Strength

The compressive strength of the one core tested by RJR Engineering, P.C. was measured to be nearly 8,000 psi. This is fairly high for this type of structure and for the era it was built in. This could be indicative of a high cement content, with good coarse aggregate strength, and relatively dense concrete with a discontinuous pore structure.

Hardened Air Content

The concrete near the water's edge has a hardened air content of approximately 2.2 percent. The measurement near the top of the ramp is only 0.4 percent. These results indicate the concrete was likely not air-entrained. Air-entrainment increases the workability of concrete during placement and provides long-lasting freeze-thaw resistance. There are a number of variables that can affect hardened air content including mix time and method of concrete placement. However, given the age of the concrete and the hardened air results, it is likely that no air-entraining agent was used in the concrete.

Depth of Carbonation

Carbonation occurs over time as alkalis in the concrete react with acidic components of the atmosphere, primarily carbon dioxide (CO_2). As concrete carbonates, concrete alkalinity is reduced. Once the depth of carbonation reaches the reinforcing steel, the passive protection around the steel provided by the alkaline concrete will be reduced and corrosion of the steel will occur more readily. In general, carbonation will advance approximately $\frac{1}{2}$ inch every 12 to 15 years of exposure to moisture and air.

The depth of carbonation is only about 1/32 of an inch (1 mm) and is described as negligible in APS' report. These results are not consistent with the general rate of advancement of carbonation. The low depth of carbonation could be related to the significant spalling of the concrete that has occurred. Dense concrete with a discontinuous pore structure could slow the rate of carbonation also.

Chloride Content

The presence of chloride ions in high concentrations in the concrete, especially where there are reinforcing bars, means that the likelihood of corrosion is high. Initially, the steel is encapsulated in a protective, passivating layer of concrete. Chloride ions destroy this layer, and corrosion (rusting) ensues with the presence of air and moisture. As steel rusts, it expands, and puts pressure on surrounding concrete. Eventually, the cover concrete will spall off as a result.

ACI-318 Table 4.3.1 outlines requirements for concrete by exposure class. The bottom portion of this table covers maximum water-soluble chloride ion content in concrete by weight of cement only. The petrography report provides water-soluble chloride content data based on the weight of the sample. This constitutes all components of the mix including the aggregates and cementitious materials. Therefore, the values in the petrographic report need to be converted in order to compare with the ACI Table 4.3.1.

The conversion is accomplished by estimating the cement content of a typical 4,000 psi concrete mix. The percentage of cementitious materials in the mix as a function of weight, could be expected to be approximately 15 percent. The values for chloride content are therefore presented as follows in Table 1:

Sample #	Location	Depth from Surface	Chloride Content (%)
		(inches)	
#1	Edge of Water	0 – 1	0.047
		1 – 2	0.047
		2 – 3	0.027
#2	Top of Ramp	0 – 1	0.053
		1 – 2	0.047
		2 – 3	0.040

Table 1 – Water Soluble Chloride Content (See Report in Appendix B)

The exposure classification for concrete that is exposed to moisture, but not exterior sources of chlorides like deicing salt, is defined as C1 according to ACI Table 4.2.1. ACI Table 4.3.1 indicates the maximum percent of water-soluble chloride ions for reinforced concrete is 0.30 for a C1 exposure.

Table 1 above indicates that the concrete has not experienced any significant ingress of chlorides into the concrete. These results would seem to be consistent with a structure that is not salted in the winter for deicing and is exposed only to freshwater.

Alkali Silica Reaction (ASR)

Both cores were cracked horizontally below the concrete surface. APS' report indicates that ASR was present in both cores and contributed to cracking. ASR occurs when aggregates containing certain forms of silica react with alkali hydroxide ions in concrete to form a gel that swells as it absorbs water. As the gel swells it puts pressure on the surrounding concrete, which eventually initiates a crack or a pop-out. APS' report provides magnified images of this gel layer, which will surround the aggregate and fill cracks and other voids in the concrete.

Conclusions

The opinions and comments stated in this report are based on limited visual observations only. Limited physical testing, including compressive strength and petrographic analysis, of the existing concrete was performed in selected locations.

In general, the visible portions of the ramp are in poor condition with severe weathering, spalling, and exposed, rusted reinforcement throughout the surface of the ramp and exposed walls. The observed deterioration can be attributed to a combination of the age of the structure, severe exposure to wind-driven precipitation, wave action, icing, sun, freeze-thaw cycles, and lack of general maintenance over the life of the structure.

The primary mechanism for deterioration of the ramp surface is freeze-thaw damage. The measured hardened air content in both core samples, indicates the concrete was not air-entrained making it highly susceptible to this type of damage.

Carbonation and Chloride Attack

In general, carbonation and chloride attack will damage concrete by attacking the reinforcement. These processes will cause rusting of the steel, which will expand and put pressure on the surrounding concrete. Steel will expand approximately 8 times its original size when it rusts, and once the pressure becomes great enough, the concrete around the reinforcement will crack and spall. The fact that exposed reinforcing bars are generally intact is evidence that this type of behavior is likely not driving the deterioration.

For concrete exposed for approximately 90 years, the low depth of carbonation would normally be surprising. However, most of the surface is actively spalling away due to freeze-thaw action. The remaining surface may not have been exposed to the atmosphere for enough time to carbonate to a significant depth. The rate of carbonation may also be slower because the concrete is dense and the pore structure is discontinuous. This presumption is based on the high concrete strength.

Measurements of chloride ingress are low because there has not been a source of chlorides at the ramp.

Compressive Strength

The compressive strength of the concrete is likely indicative of a fairly durable and dense concrete with a discontinuous pore structure and low permeability. These properties will help to slow freeze-thaw action, but not prevent it. The condition of the ramp would likely be much worse if the strength of the concrete was lower.

Alkali Silica Reaction (ASR)

Alkali silica reaction is playing a role in the deterioration of the concrete but the primary cause is freeze-thaw damage from exposure, age, and lack of air-entrainment. ASR will continue to progress as water penetrates deeper into the concrete.

Overall, the condition of the ramp is not surprising given these factors, and further deterioration will occur if the ramp is left in its current condition. Despite the deterioration, the structure appeared to be stable, and there were no obvious signs of listing or differential settlement.

There are a number of options that could be explored with regard to rehabilitating the ramp. However, without existing structural drawings, there are many unknowns regarding the size, location, and type of structural components that make up the ramp. Original loading information for the ramp is also not available.

There are portions of the ramp slab that are not supported by grade below and are intended to function as structural slabs. The slab has undergone significant deterioration of the top surface in the form of spalling and much of the reinforcement is totally exposed. Reinforcement that is totally exposed and separated from the concrete is not developed and no longer serves a structural purpose. Based on this observation, we expect portions of the slab capacity has been reduced since original construction.

Observations of the ramp were very limited overall. The condition of the underside of the slabs, interior faces of walls, foundations, and any portion of the ramp below the water line could not be verified. More investigation and selective demolition are required to develop a comprehensive conditions assessment and recommendations for the ramp. This would involve observations below the water line and observations within any vaults or chambers below the ramp slab. Without more field verification, it will be very difficult to determine the capacities of existing structural elements and develop the scope of work for repairs and rehabilitation if such action is desired.

This ramp can likely be rehabilitated and adapted for future use. However, the scope of work and cost of repairs cannot be accurately determined based on the observations and testing completed so far.

Recommendations

Recommendations for repair and rehabilitation will depend on the final design intent for the ramp. If it is determined that the ramp is to be rehabilitated and used, we recommend the following at a minimum:

- Determine if Construction Documents of the original ramp are available through the Buffalo City Hall or Historic American Engineering Record (HAER). This was a large structure that was clearly designed for a purpose. Records of these types of projects can often be found in city archives.
- 2. Perform selective demolition of the ramp slab to provide access to the interior of the structure to determine the condition of the underside of the ramp slab and interior faces of walls. There is likely deterioration of the bottom side of the structural ramp slabs.
- 3. Perform underwater observation of the ramp to determine the foundation system for the ramp if possible, and the condition of the concrete where it is not visible.
- 4. Perform additional measurements with appropriate equipment to determine if the ramp has undergone significant differential settlement.
- 5. Determine size and spacing of reinforcement and thickness of concrete elements during demolition and/or through nondestructive methods.
- 6. Perform an analysis of the ramp slabs based on information determined from selective demolition to determine the general capacity of the structure.
- 7. Perform restoration and repairs to the concrete based on the intended use of the structure and required structural capacity for the intended use.

Recommended additional observations will require the use of trained divers and personnel with confined space training.

If you have any questions with regard to this report, please call our office.

Sincerely,

RYAN BIGGS | CLARK DAVIS ENGINEERING & SURVEYING, D.P.C.

Kyle Oberdorf, P.E. Professional Engineer

Christopher N. Latreille, P.E. Principal Associate

Attachments

RJR Engineering, P.C. Professional Engineers



23 Mechanic St - PO Box 344 - Springville, NY 14141 / 2745 Broadway St - Suite 10 - Cheektowaga, NY 14227 Ph.: 716.592.3980 - Fax: 716.592.4216 - www.rjrpc.com

Concrete Compressive Strength Core Report

PROJECT: Lasalle Park Ramp	DATE: <u>9/21/2017</u>
CLIENT: Ryan Biggs/ Clark Davis Engineering CONCRETE SUPPLIER: N/A	CONTRACTOR: N/A JOB NUMBER:17222
CORE LOCATION: Top of existing concrete launch	JOB NUMBER. 17222
CONE LOCATION. Top of existing concrete launch	
Core #: 1 Compression	<u></u>
Age of Concrete: N/A	
Date of Placement: N/A	
Date Core Removed: 9/21/2017	
Date Core Tested: 9/26/2017	
Mix ID#: N/A	
Maximum Size of Aggregate: 1"	
Type of Break: 5 Average Core Diameter: 2.75"	
Average Core Diameter: 2.75"	
Original Core Length: 5.75"	
Trimmed Core Length: 5.0"	
Capped Core Length: 5.5"	
Length/Diameter Ratio: 2/1	
Cross Sectional Area: 5.94	
Maximum Load: 47480	
Uncorrected Compressive Strength: 7990psi	
Corrected Compressive Strength: N/A	If fracture pattern is not typical pattern,
	sketch and describe briefly in box.
Testing Machine: CM-001	
Due Date for Calibration: 5/23/2017	
546 5416 101 Gaillotti. <u>0/20/2011</u>	
Test Results Computed by: Jeremy Lake	Date: 9/26/2017
,	
Reviewed by:	Date: 10/5/2017



REPORT OF CONCRETE TESTING

PROJECT: REPORTED TO:

LASALLE PARK LAKE RAMP INVESTIGATION RBCD PROJECT NO.: 11833 BUFFALO, NY

PO BOX 217 SKANEATELES FALLS, NY 13153

ENGINEERING & SURVEYING, D.P.C

ATTN: CHRIS LATRIELLE

RYAN BIGGS CLARK DAVIS

APS PROJECT NO: 10-09229 **DATE:** OCTOBER 31, 2017

INTRODUCTION

This report presents the results of laboratory work performed by our firm on two concrete core samples submitted to us by Mr. Chris Latrielle of Ryan Biggs Clark Davis Engineering & Surveying, D.P.C., on September 26, 2017. We understand the concrete cores were obtained from exterior concrete aviation ramp that enters Lake Erie that is currently under evaluation. The concrete was reportedly placed circa 1930. The scope of our work was limited to performing petrographic analysis testing of both cores to document the overall quality of the concrete.

CONCLUSIONS

Based on our observations, test results, and past experience, our conclusions are as follows:

- 1. The overall quality of the concrete of both cores was poor due primarily to the lack of an effective entrained air system and the presence of active alkali-silica reactivity (ASR) in the concrete. The cement paste was moderately dense and hard with carbonation at the surface us to 1/32". The alluvial gravel coarse aggregate was relatively hard, but reactive. The concrete was not purposefully air entrained and was placed with a generally moderate water content.
- 2. The concrete is both cores contained an air void system that is not consistent with current technology for resistance to freeze-thaw deterioration when saturated. We observed subhorizontal freeze-thaw cracking in both cores and expect deterioration to occur if the concrete is exposed to moisture and freezing conditions.
- 3. Active alkali-silica reactivity (ASR) was also observed in both cores and contributed to the cracking observed. We consider the level of reactivity to be very minor, but expect reactivity to continue if the concrete is exposed to moisture.

SAMPLE IDENTIFICATION

Sample Number: Edge of Water Top of Ramp

Sample Type: Hardened Concrete Core

Original Sample 70 mm (2-3/4") diameter by 70 mm (2-3/4") diameter by Dimensions: 102 mm (4") long 84 mm (3-1/2") long

TEST RESULTS

Our complete petrographic analysis test results appear on the attached sheet entitled 24-LAB-001 "Petrographic Examination of Hardened Concrete, ASTM C856." A brief summary of the general concrete properties is as follows:

- 1. The coarse aggregate in the cores was comprised of 3/4" maximum sized alluvial gravel that was well graded with good overall distribution.
- 2. Pozzolanic admixture were not observed in either concrete sample.
- 3. The paste color of the cores was medium light gray with the slump estimated to be medium to high (3-5").
- 4. The paste hardness of the cores was judged to be medium to hard with the paste/aggregate bond considered fair to good.
- 5. The depth of carbonation in both cores ranged from negligible up to 1 mm (1/32).
- 6. The water-to-cement ratio of the cores was estimated at between 0.45 and 0.50 with approximately 5 to 7% residual portland cement clinker particles.

Air Content Testing

Sample Identification:	Edge of Water	Top of Ramp
Total Air Analysis -		
Air Void Content, %	2.2	0.4
Spacing Factor, in.	0.069	0.096
Entrapped Air (%)	1.5	0.1
Entrained Air (%)	0.7	0.3

TEST PROCEDURES

Laboratory testing was performed on September 26, 2017 and subsequent dates. Our procedures were as follows:

Petrographic Analysis

A petrographic analysis was performed in accordance with APS Standard Operating Procedure 24-LAB-001, "Petrographic Examination of Hardened Concrete," ASTM C856-latest revision. The petrographic analysis consisted of reviewing cement paste and aggregate qualities on a whole basis as well as on a cut/polished section. The depth of carbonation was documented using a phenolphthalein indicator solution applied on a freshly cut and polished surface of the concrete sample. The water/cement ratio of the concrete was estimated by viewing a thin section of the concrete under a Nikon E600 polarizing microscope at magnification up to 600x. Thin section analysis was performed in accordance with APS Standard Operating Procedure 24-LAB-009, "Determining the Water/Cement of Portland Cement Concrete, APS Method." The sample is first highly polished then epoxied to a glass slide. The excess sample is cut from the glass and the slide is polished until the concrete reaches 25 microns or less in thickness.

REMARKS

The test samples will be retained for a period of at least thirty days from the date of this report. Unless further instructions are received by that time, the samples may be discarded. Test results relate only to the items tested. No warranty, express or implied, is made.

Report Prepared by:

American Petrographic Services, Inc.

Scott F. Wolter, PG

President

MN License No. 30024 Phone: 651-659-1345 swolter@amengtest.com

24-LAB-001 Petrographic Examination of Hardened Concrete ASTM C856

Project No. 10-09229 Date: October 20, 2017 Date reviewed: October 27, 2017 Sample ID: Edge of water Performed by: W. Reely Reviewed by: B. Lemcke

I. General Observations

1. Sample Dimensions: Our analysis was performed on one lapped side of an 102 mm (4") x 70 mm (2-3/4") x 33 mm (1-5/16") thick profile section and a 76 mm (3") x 51 mm (2") thin section that were saw-cut and prepared from the original 70 mm (2-3/4") diameter x 102 mm (4") long core.

2. Surface Conditions:

Top: Rough, irregular, mortar-eroded surface Bottom: Rough, irregular, fractured surface

3. Reinforcement: None observed

4. General Physical Conditions: The top up to 25 mm (1") of the core had broken away from the rest of the core due to a sub-horizontal fracture located between 19 mm (3/4") and 25 mm (1") depth. The fracture propagated through one coarse aggregate particle. The top section was re-attached in-lab using cyanoacrylate adhesive.

An "X" had been painted on the top surface with neon red ink. The top surface was covered with an up to 1 mm (1/32") thick layer of dried slurry upon arrival, which was cleaned off in-lab. The top surface had undergone mortar erosion to an unknown depth, exposing many fine aggregate particles and a few coarse aggregate particles. The depth of carbonation was measured from the top surface and ranged from negligible to 1 mm (1/32") depth. Several sub-horizontal microcracks, which spanned the diameter of the core, were observed between 1 mm (1/32") and 25 mm (1") depth. The microcracks propagated through a few fine aggregate particles. White, acicular ettringite lined to partially filled a few of the microcracks. Colorless to white alkali-silica gel lined one entrapped-sized air void at 15 mm (9/16") depth. One sub-vertical microcrack propagated from an alkali-silica reactive (ASR) sandstone coarse aggregate particle near the bottom fractured surface of the core. The microcrack exhibited deposits of white ASR gel proximal to the sandstone particle. A few partially disintegrated wood particles were observed at various depths within the core. White, acicular ettringite lined to filled many air voids throughout the core outside of the carbonated zone. The concrete was not air-entrained and contained an air-void system not consistent with current American Concrete Institute (ACI) recommendations for freeze-thaw resistance.

II. Aggregate

1. Coarse: 19 mm (3/4") nominal sized mixed natural and crushed gravel composed of sandstone, sparitic limestone,

sandy micritic limestone, and granite. The particles were mostly round to sub-round. The coarse aggregate

appeared well graded and exhibited good overall distribution.

2. Fine: Natural quartz, feldspar, carbonate, and lithic sand (as sand/siltstone, chert, and granite, with several shale and

iron oxide grains). The grains were mostly sub-rounded with many smaller sub-angular particles. The fine

aggregate appeared fairly graded and exhibited good overall uniform distribution.

III. Cementitious Properties

1. Air Content: 2.2% total

2. Depth of carbonation: Ranged from negligible to 1 mm (1/32").

3. Paste/aggregate bond: Fair to good.

4. Paste color: Similar to but darker than light olive gray to medium light gray (Munsell[®] 5Y 6/1 to N6).

5. Paste hardness: Moderately hard (Mohs \approx 3.5).

6. Microcracking: Several sub-horizontal microcracks, which spanned the diameter of the core, were observed

between 1 mm (1/32") and 25 mm (1") depth.

7. Secondary deposits: White, acicular ettringite lined to partially filled a few of the sub-horizontal microcracks. White,

acicular ettringite lined to filled many air voids throughout the core Colorless to white alkalisilica gel lined one entrapped-sized air void at 15~mm (9/16") depth and partially filled sub-

vertical microcracking along a sandstone coarse aggregate margin.

8. w/cm: Estimated at between 0.45 and 0.50 with approximately 5 to 7% residual portland cement clinker

particles

9. Cement hydration: Alites: Fully

Belites: Well to fully

24-LAB-001 Petrographic Examination of Hardened Concrete ASTM C856

10-09229 October 20, 2017 Date reviewed: October 27, 2017 Project No. Date: Performed by: Sample ID: Top of ramp W. Reely Reviewed by: B. Lemcke

General Observations I.

Sample Dimensions: Our analysis was performed on one lapped side of an 84 mm (3-1/2") x 70 mm (2-3/4") x 33 mm (1-5/16") thick profile section and a 76 mm (3") x 51 mm (2") thin section that were saw-cut and prepared from the original 70 mm (2-3/4") diameter x 84 mm (3-1/2") long core.

2. **Surface Conditions:**

Top: Rough, irregular, mortar-eroded surface Bottom: Rough, irregular, fractured surface

3. Reinforcement: None observed

4. General Physical Conditions: The top surface had undergone mortar erosion to an unknown depth, exposing numerous fine aggregate particles and a few coarse aggregate particles. A few small, thin spots of orange paint were observed on the top surface. The depth of carbonation was measured from the top surface, and was negligible. Swarms of subhorizontal and sub-parallel microcracks, macro-cracks, and fractures, spanning the entire diameter of the core, were observed through the full depth of the core sample. The cracks and fractures propagated through a few coarse aggregate particles. The fractures were stabilized in-lab using cyanoacrylate adhesive prior to sample preparation, to prevent sample disintegration. White accicular ettringite and tabular portlandite was observed lining to partially filling several of the cracks and fractures. Colorless to white alkali-silica gel was observed lining a few of the cracks; the offending particles appeared to be sandstone and chert coarse aggregate particles, as well as one granite particle observed in thin section. Gel "plugs" were observed in microcracks at the top surface of a few coarse aggregate particles which had been penetrated by the microcracks. The concrete was not air-entrained and contained an air-void system not consistent with current American Concrete Institute (ACI) recommendations for freeze-thaw resistance. White, acicular ettringite filled a majority of air voids throughout the core. Several deposits of white acicular ettringite and a few deposits of white alkali-silica gel were observed on the bottom surface of the core.

II. Aggregate

19 mm (3/4") nominal sized mixed natural and crushed gravel composed of granite, sandstone, silty sandstone, Coarse: 1.

siltstone, silty limestone, and chert. The particles were mostly round to sub-round. The coarse aggregate

appeared well graded and exhibited good overall distribution.

Natural quartz, feldspar, carbonate, and lithic sand (as sand/siltstone, chert, and granite, with several shale and 2. Fine: iron oxide grains). The grains were mostly sub-rounded with many smaller sub-angular particles. The fine

aggregate appeared fairly graded and exhibited good overall uniform distribution.

III. **Cementitious Properties**

1. Air Content: 0.4% total Depth of carbonation: Negligible. Paste/aggregate bond: Fair to good. 3.

Paste color: Similar to but darker than light olive gray (Munsell[®] 5Y 6/1). 4.

Paste hardness: 5. Moderate (Mohs \approx 3).

Swarms of sub-horizontal and sub-parallel microcracks, macro-cracks, and fractures, spanning 6. Microcracking:

the entire diameter of the core, were observed through the full depth of the core sample.

Secondary deposits: White acicular ettringite and tabular portlandite was observed lining to partially filling several

of the cracks and fractures. Colorless to white alkali-silica gel was observed lining a few of the cracks; the offending particles appeared to be sandstone and/or chert coarse aggregate particles. White, acicular ettringite filled a majority of air voids throughout the core. Several deposits of white acicular ettringite and a few deposits of white alkali-silica gel were observed on the bottom

surface of the core.

w/cm: Estimated at between 0.45 and 0.50 with approximately 5 to 7% residual portland cement clinker

particles

Alites: Well to fully Cement hydration:

Belites: Well



AIR VOID ANALYSIS

ATTN:

PROJECT: REPORTED TO:

LASALLE PARK LAKE RAMP INVESTIGATION

RBCD PROJECT NO.: 11833

BUFFALO, NY

RYAN BIGGS CLARK DAVIS ENGINEERING & SURVEYING, D.P.C. PO BOX 217 SKANEATELES FALLS, NY 13153

CHRIS LATRIELLE

APS PROJECT NO: 10-09229 **DATE:** OCTOBER 20, 2017

Sample ID: Edge of Water

Conformance: The concrete contains an air void

system which is not consistent with current American Concrete Institute (ACI) recommendations for freeze-

thaw resistance.

Sample Data

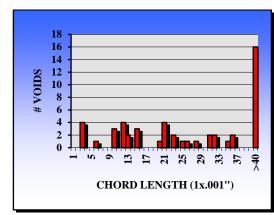
Test Data:

Description: Hardened Concrete Core
Dimensions: 70 mm (2-3/4") diameter by
102 mm (4") long

By ASTM C457, Procedure A**

Air Void Content % 2.2 Entrained, % < 0.040"(1 mm)0.7 Entrapped, %> 0.040"(1mm) 1.5 Air Voids/inch 0.6 Specific Surface, in²/in³ 100 Spacing Factor, inches 0.069 Paste Content, % estimated 26 Magnification 50x Traverse Length, inches 90

Test Date 10/19/2017 Test Performed By W. Reely





Magnification: 15x
Description: Hardened air void system.

^{**} An insufficient amount of sample was received to produce enough prepared surface area for air-void system analysis fully consistent with ASTM C457



AIR VOID ANALYSIS

PROJECT:

REPORTED TO:

LASALLE PARK LAKE RAMP INVESTIGATION

RBCD PROJECT NO.: 11833

BUFFALO, NY

RYAN BIGGS CLARK DAVIS ENGINEERING & SURVEYING, D.P.C. PO BOX 217

SKANEATELES FALLS, NY 13153

ATTN: CHRIS LATRIELLE

APS PROJECT NO: 10-09229 **DATE:** OCTOBER 20, 2017

Sample ID: Top of Ramp

Conformance: The concrete contains an air void

system which is not consistent with current American Concrete Institute (ACI) recommendations for freeze-

thaw resistance.

Sample Data

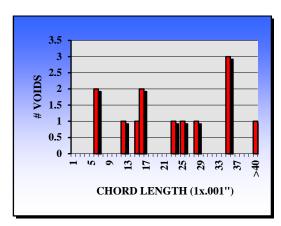
Description: Hardened Concrete Core
Dimensions: 70 mm (2-3/4") diameter by

84 mm (3-1/2") long

Test Data: By ASTM C457, Procedure A**

Air Void Content % 0.4 Entrained, % < 0.040"(1 mm)0.3 Entrapped, %> 0.040"(1mm) 0.1 Air Voids/inch 0.1 Specific Surface, in²/in³ 150 Spacing Factor, inches 0.096 Paste Content, % estimated 28 Magnification 50x Traverse Length, inches 90

Test Date 10/20/2017 Test Performed By W. Reely





Magnification: 15x
Description: Hardened air void system.

^{**} An insufficient amount of sample was received to produce enough prepared surface area for air-void system analysis fully consistent with ASTM C457

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY

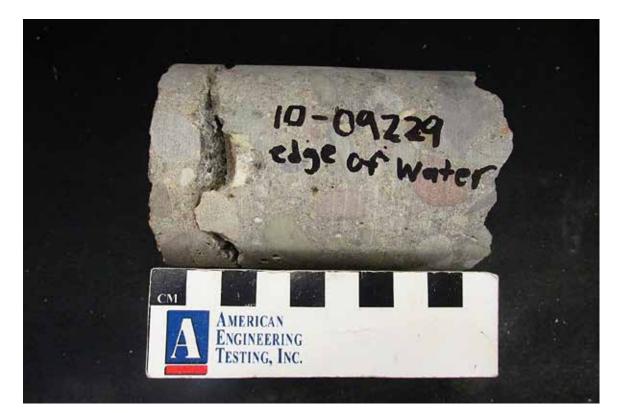


PHOTO: 1



Edge of water

DESCRIPTION:

N: The overall profile of the core as received, with the top surface oriented to the left.





SAMPLE ID:

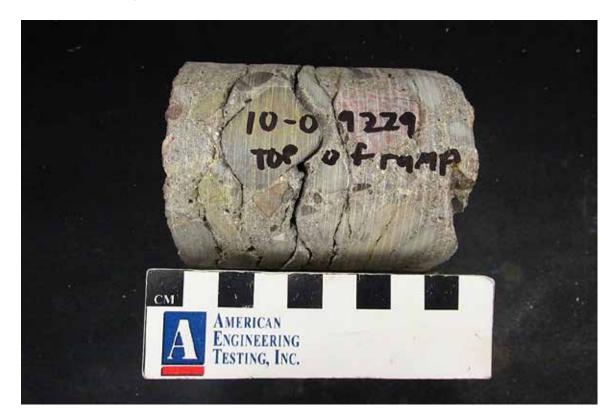
Edge of water

DESCRIPTION:

The top surface of the core as received.

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY



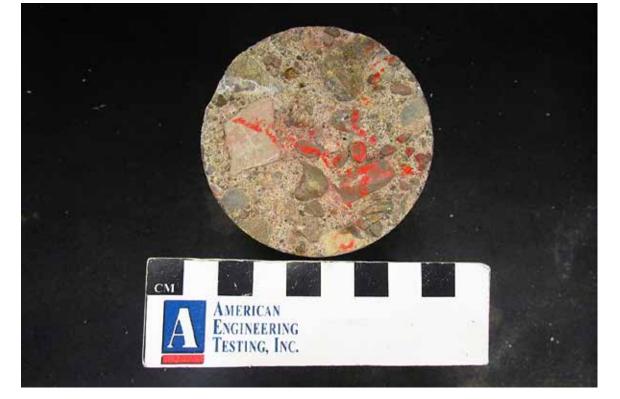
РНОТО: 3

SAMPLE ID:

Top of ramp

DESCRIPTION:

The overall profile of the core as received, with the top surface oriented to the left.



РНОТО: 4

SAMPLE ID:

Top of ramp

DESCRIPTION:

The top surface of the core as received.

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY

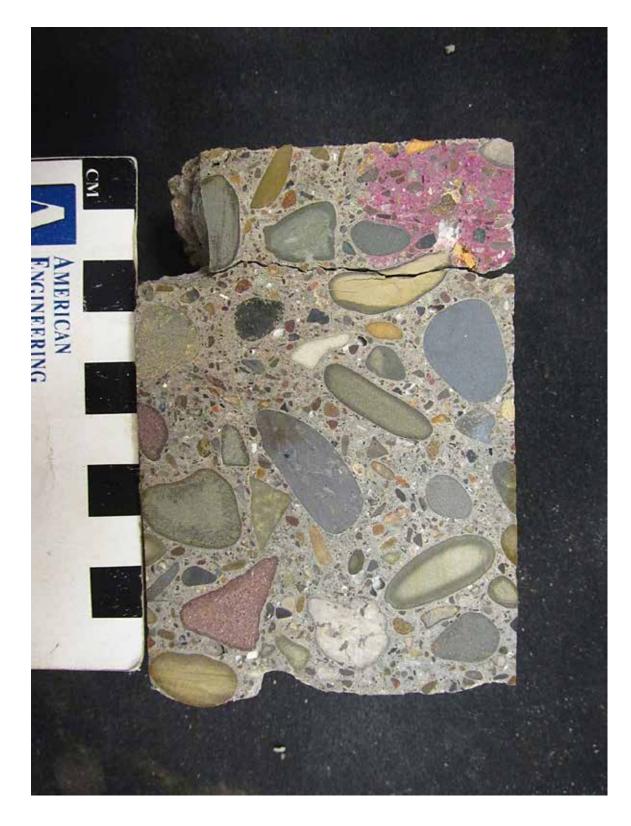


PHOTO: 5

SAMPLE ID: Edge of water

DESCRIPTION: Freshly saw-cut and lapped profile of the core with the top surface oriented to the top of the photo, after application of pH indicator to the top right corner to check depth of carbonation. Note the abundant subhorizontal cracking.

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY

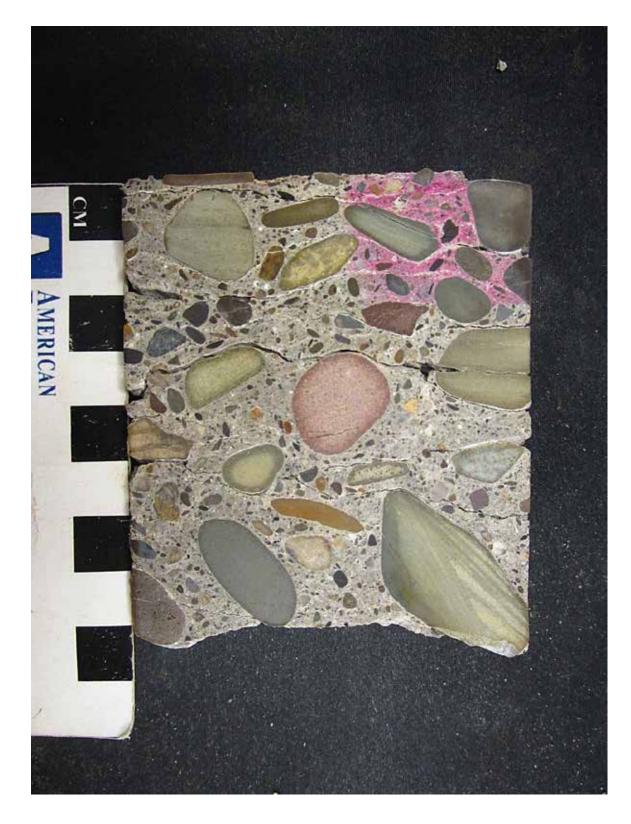


PHOTO: 6

 $\textbf{SAMPLE ID:} \ \mathsf{Top} \ \mathsf{of} \ \mathsf{ramp}$

DESCRIPTION: Freshly saw-cut and lapped profile of the core with the top surface oriented to the top of the photo, after application of pH indicator to the top right corner to check depth of carbonation. Note the abundant subhorizontal cracking through the entire depth of the core sample.

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY

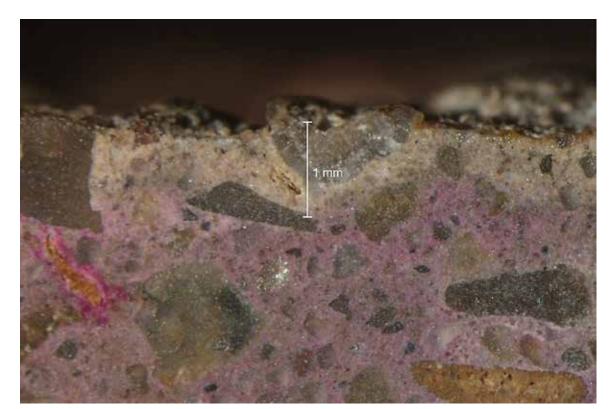


PHOTO: 7

SAMPLE ID: MAG:

Edge of water 30x

DESCRIPTION: Carbonation (unstained paste) proceeded to a maximum depth of 1 mm (1/32"); on a freshly saw-cut and lapped profile of the core with the top surface oriented up, after application of phenolphthalein pH indicator.



PHOTO: 8

Edge of water 15x

DESCRIPTION: A minor amount of white alkali-silica gel (red arrow) lining an entrapped-sized air void. Paste has been stained magenta by pH indicator.

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY



PHOTO: 9

SAMPLE ID: MAG:

Edge of water 30x

DESCRIPTION:

 $\label{eq:Asmall} A small, partially-disintegrated wood particle (red arrow) in the concrete.$



PHOTO: 10

Top of ramp 30x

DESCRIPTION:

White, acicular ettringite filling spherical, entrained-sized air voids (red arrows).

PROJECT: LASALLE PARK LAKE RAMP INVESTIGATION, RBCD PROJECT NO.: 11833

BUFFALO, NY

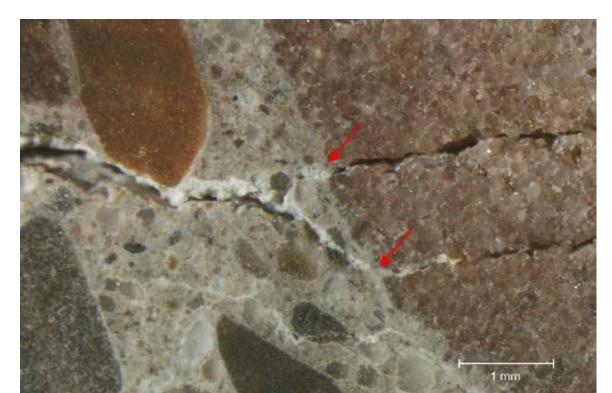


PHOTO: 11

SAMPLE ID: MAG:

Top of ramp 30x

DESCRIPTION: Colorless to white alkali-silica gel partially filling a sub-horizontal micro-crack and forming gel "plugs" (red arrows) at the outer surface of a sandstone coarse aggregate particle (right)

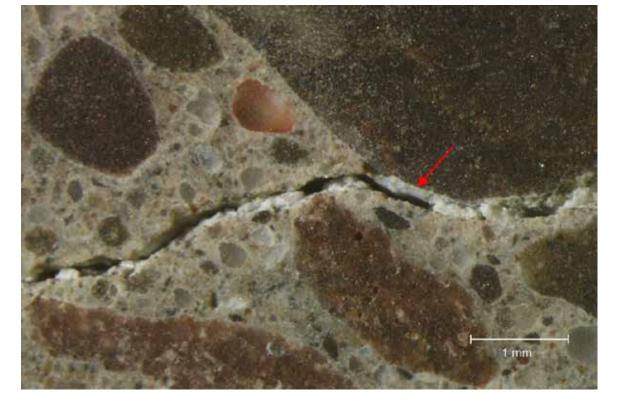


PHOTO: 12

Top of ramp 30x

DESCRIPTION:

White ettringite lining a sub-horizontal micro-crack (red arrow).

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BUFFALO, NY

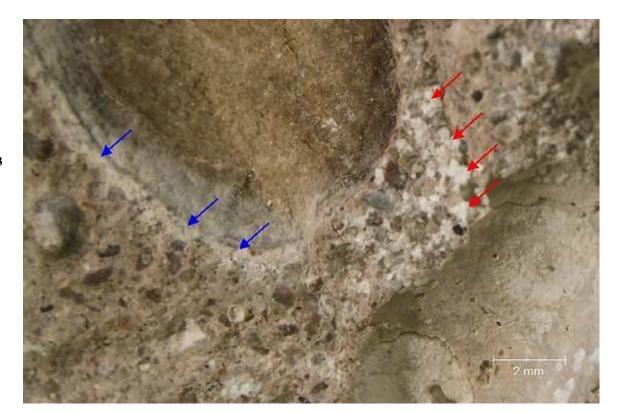
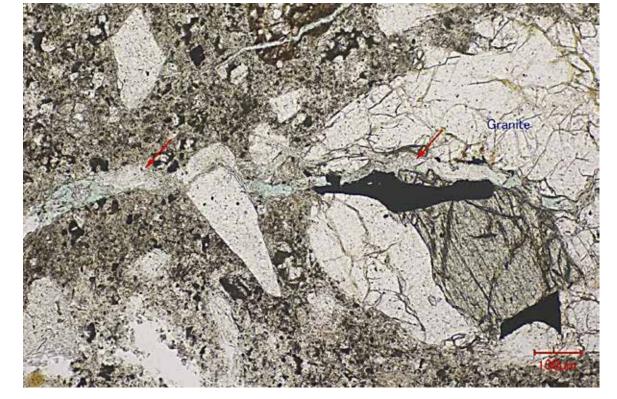


PHOTO: 13

SAMPLE ID: MAG:

Top of ramp 10x

DESCRIPTION: Deposits of white, acicular ettringite (red arrows) and alkali-silica gel (blue arrows) on the fractured bottom surface of the core.



РНОТО: 14

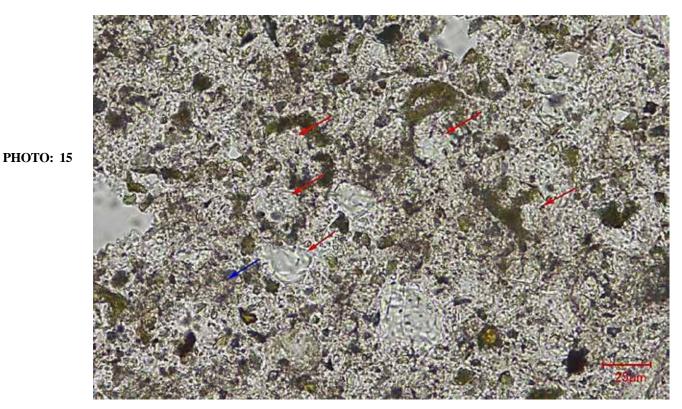
SAMPLE ID: MAG:

Top of ramp 100x

DESCRIPTION: Portlandite and ettrignite (red arrows) partially filling a sub-horizontal microcrack along the margin of a granite coarse aggregate particle, in a thin section of concrete viewed under plane-polarized light.

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BUFFALO, NY



SAMPLE ID:

MAG:

Edge of water 400x

DESCRIPTION: Fully-hydrated alite relicts (red arrows) and well-hydrated residual belite (blue arrow) as portland cement clinker particles in a thin section of concrete, viewed under plane-polarized light.

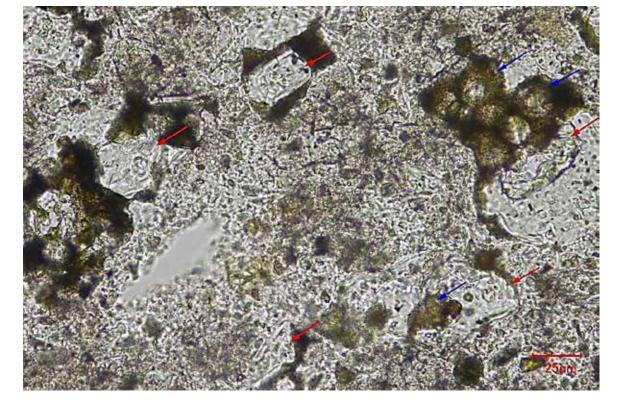


PHOTO: 16

Top of ramp 400x

DESCRIPTION: Well to fully-hydrated residual alite (red arrows) and well-hydrated residual belite (blue arrow) as portland cement clinker particles in a thin section of concrete, viewed under plane-polarized light.



REPORT OF CHEMICAL ANALYSIS

PROJECT: REPORTED TO:

LASALLE PARK LAKE RAMP INVESTIGATION RBCD PROJECT NO.: 11833

BUFFALO, NY

RYAN BIGGS CLARK DAVIS

ENGINEERING & SURVEYING, D.P.C.

PO BOX 217

SKANEATELES FALLS, NY 13153

ATTN: CHRIS LATREILLE

APS PROJECT NO: 10-09229 **DATE:** OCTOBER 31, 2017

INTRODUCTION

This report presents the results of laboratory work performed by our firm on two (2) cores submitted to us by Chris Latreille of Ryan Biggs Clark Davis Engineering & Surveying, D.P.C. on September 26, 2017. The scope of our work was limited to documenting the chloride content of the cores at depths of 0 - 1", 1 - 2", and 2 - 3" by ASTM C1218, "Standard Test Method for Water-Soluble Chloride in Mortar and Concrete."

TEST RESULTS

Sample <u>Identification</u>	Sample <u>Depth</u>	Water-Soluble Chloride by Weight of Sample, %	ppm (mg/Kg)
Edge of Water	0 - 1"	0.007	66
	1 - 2"	0.007	67
	2 - 3"	0.004	39
Top of Ramp	0 - 1"	0.008	77
	1 - 2"	0.007	73
	2 - 3"	0.006	61

TEST PROCEDURES

Laboratory testing was performed on October 12, 2017 and subsequent dates. Testing was performed following ASTM C1218 "Standard Test Method for Water-Soluble Chloride in Mortar and Concrete." The core samples were cut at the designated depths, crushed, dried in an oven, and processed to pass a #20 US Standard mesh sieve. Results are reported on a dry weight 105 °C basis.

REMARKS

The test samples will be retained for a period of at least thirty days from the date of this report. Unless further instructions are received by that time, the samples may be discarded. The test results relate only to the samples tested. No warranty, express or implied, is made.

Report Prepared by:

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Emma Schneider

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Report Reviewed by:

American Engineering Testing, Inc.

Bill Rebel

Principal Chemist

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