APPENDIX

APPENDIX

The appendix contains more detailed information on aspects of the planning process discussed in the report.

Below is a list of all the community meetings held over the course of the project. During each phase, the advisory committee meetings were held before the community meetings and were used to refine and clarify content before presenting it to the general public. There were multiple community meetings in each phase to maximize opportunities for public engagement, but the content for each of those meetings was the same.

Anyone wishing to view the presentations made during the planning process, may do so by visiting the EngagePGH website, which contains both the presentation materials and recordings of the community meetings.
engage.pittsburghpa.gov/mellon-park-action-plan

Engagement Meetings held during the planning process:

Listen and Analyze

11 March 2021	Advisory Committee Meeting # 1
22 April 2021	Advisory Committee Meeting # 2
8, 11 & 12* May 2021	Community Listening Sessions
15 June 2021	Advisory Committee Meeting #3
7 July 2021	Focus Group: Sports
12 July 2021	Focus Group: Stormwater
13 July 2021	Focus Group: Safety and Access
19 July 2021	Focus Group: Art, History, and Culture
20 July 2021	Focus Group: Events and Programming
21 July 2021	Focus Group: Off-leash Dogs
5 August 2021	Design Charrette #1

Ideate

7 October 2021	Design Charrette #2
11 October 2021	Advisory Committee Meeting #4
16 (x2) & 20* October 2021	Community Meetings - Concept Presentations

Refine

09 March 2022	Advisory Committee Presentation #5
22*, 24 & 26 March 2022	Community Meetings Preferred Plan Presentation

Moving to Action

3 May 2022	Advisory Committee Presentation #6

* Recording available

MEMO

From: Cesar Simon

To: Brandon Riley

Date: May 3, 2022

Ref.: PPC Mellon Park Stormwater Plan

Background

The Pittsburgh Parks Conservancy is partnering with the City of Pittsburgh to develop an Action Plan for Mellon Park. The Action Plan aims to create a unified vision for Mellon Park driven by community input through a thorough engagement process with residents, park users, city partners, and other stakeholders and agencies. The Action Plan will guide all future planning, development, and improvement opportunities in and around Mellon Park to ensure its status as one of Pittsburgh's signature parks and open spaces.

Situated at the top of the Negley Run Watershed, the Conservancy recognizes that Mellon Park has the potential to provide significant stormwater, green infrastructure, and ecological improvements to the surrounding community. The Action Plan will seek to ascertain Mellon Park's potential to improve stormwater management for the Negley Run Watershed and identify green infrastructure strategies that meet stormwater management goals while balancing the preservation of critical historic and cultural assets, ecological enhancements, and programming needs. A successful project will identify realistic and appropriate stormwater and green infrastructure improvement projects that respond to community feedback while respecting the historic and cultural significance of the Park, including protections afforded to the Park through its new designation as a historic site.

The PWSA Green First Plan identified a city-wide strategy to implement GSI to meet ALCOSAN & PWSA CSO regulatory requirements while improving the service provided by existing infrastructure. The A-42 Sewershed is in the City of Pittsburgh and includes parts of the neighborhoods of Homewood, Larimer, Point Breeze, Highland Park, Lincoln-Lemington-Belmar, East Liberty, and Squirrel Hill. The sewershed is served by a combined sewer system. The A-42 combined system overflow (CSO) is estimated to contribute the most overflow volume in the PWSA system, approximately 1,442 million gallons in a typical year. Thus, PWSA has identified A-42 as a priority area for green stormwater infrastructure (GSI) to reduce combined system overflows at a sewershed scale and improve local system conditions, including areas that experience surface and basement sewage flooding.

In a past experience, Cosmos was tasked with developing a GIS modeling process as a screening method for Green Stormwater Infrastructure (GSI) opportunity within the A-42 sewershed. The process involved implementing various GIS analytical steps to define buffer areas around potential constraints resulting in zones of potential opportunity for the installation of GSI in the public rights-of-way and within private vacant parcels. These GSI opportunity areas were further screened based on stormwater management potential by defining each area's loading ratio hydrologic factor attribute. Cosmos then ranked various options for consideration. This experience serves us to understand the stormwater requirement of the Area around Mellon Park and follow an engineering process that will address stormwater impact in the overall A-42 Sewershed.

Stormwater Analysis Approach

To assess the present Mellon Park stormwater runoff conditions, we completed an initial project SWMM model and identified opportunities for GSI implementation. When establishing potential GSI locations, a key consideration is leveraging the existing drainage infrastructure to route stormwater runoff to and from these collection/storage areas.

A project SWMM model was constructed using the calibrated ALCOSAN A-42 model as the basis. The A-42 Sewershed Area is around 2,862 acres. As the ALCOSAN interceptor systems are located in the lower reaches of the A-42 sewershed, the modeled sewer network only partially extends upslope through the sewershed. As such, the A-42 model does not currently include the sewer network in the vicinity of Mellon Park. To allow for a more localized and nuanced assessment of the existing sewer system's response to proposed GSI installations, the SWMM model was extended upslope through the Mellon Park parcels. Missing portions of the existing pipe network from the present ALCOSAN modeled terminus at Negley Run Boulevard through the upper subcatchments immediately above Mellon Park were reestablished using available geographic information systems (GIS) data and historical drawings.

The stormwater analysis steps outlined below were developed as a structured approach for the sizing and location of the proposed Mellon Park GSI improvements. The intent was to develop a framework that initially defines the scale of the proposed stormwater runoff capture and then refines the distribution and size of the proposed GSI improvements within Mellon Park to best balance implementation cost with local flooding and combined sewer overflow reduction benefits.

1. Establish Mellon Park Basin Characteristics:

We defined the available sewershed and associated runoff tributary to Mellon Park. Preliminary runoff volumes and peak runoff rates were generated for the 1.5-inch, 24-hour (SCS Type II storm event), representing the 95th percentile rainfall event for Mellon Park and its Basin Subcatchment. Those results indicate that Mellon Park parcels contribute approximately 0.5 Million Gallons (MG) (~66,840 cubic feet) of stormwater runoff (for the 1.5-inch, 24-hour storm event) to the Mellon Park Basin Subcatchment and the larger A-42 sewershed. In detail, the northern section of the Park contributes 0.26 MG and the south section with 0.24 MG.

The Park has the potential to manage 100% of this equivalent runoff volume within the park boundary through a combination of onsite capture and routing of offsite runoff into the Park using selective drainage infrastructure enhancements. Following ALCOSAN's Green Revitalization of Our Waterways (GROW) funding program, we implemented a conservative analysis of the GSI features, not increasing the infiltration or evaporation areas to maintain the calibrated sewershed hydrology balance.

Figure 1 below presents the initial estimation of the Mellon Park basin. The tributary Sewershed Area to Mellon Park is around 220 acres (7.7% of the A-42 Sewershed area).

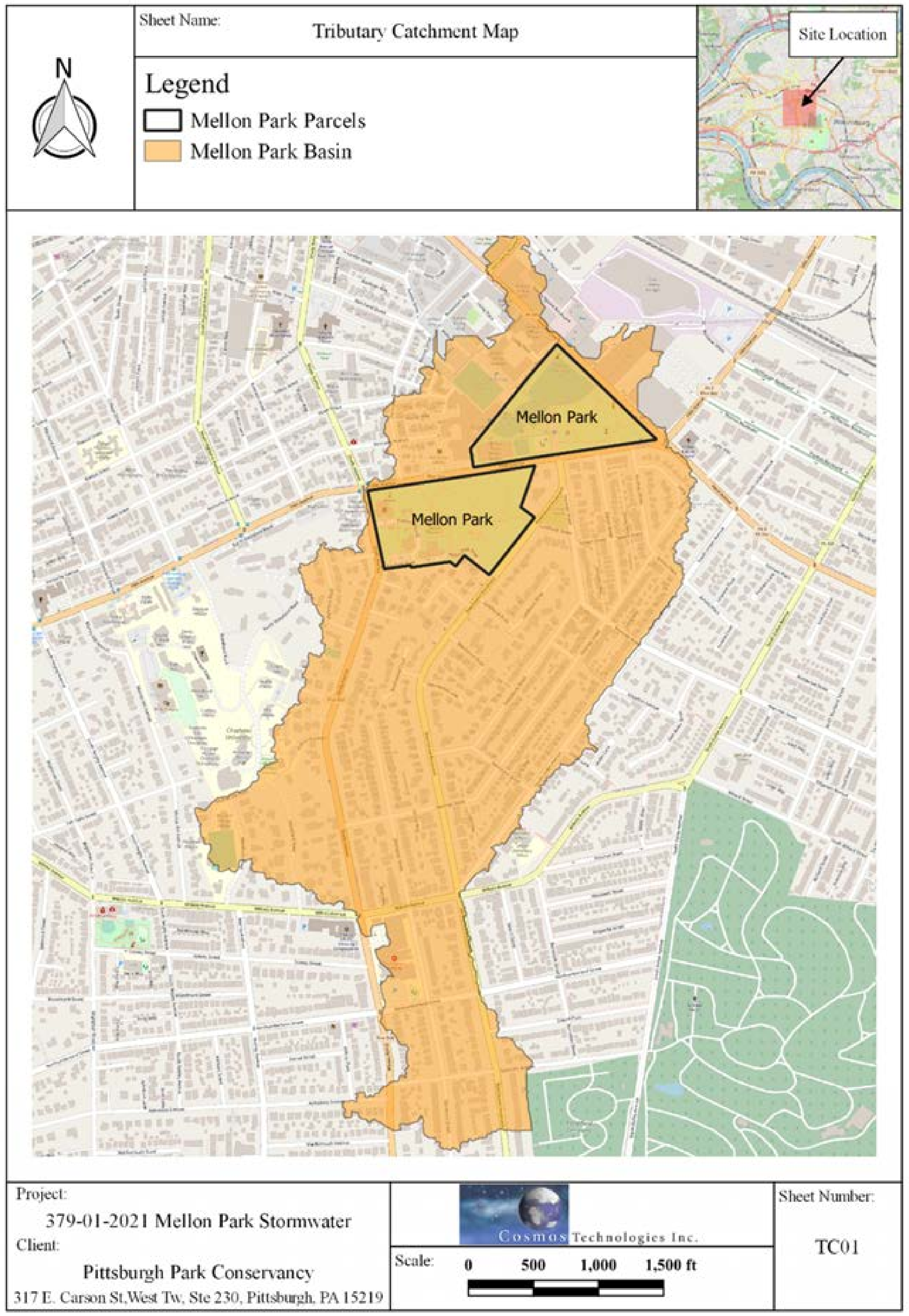

Figure 1. Tributary Catchment Map

2. Develop Enhanced SWMM Model:

We improved the ALCOSAN model resolution presented above to include the Mellon Park tributary subcatchments by the following steps:

1. We extended the geographic limits of the available SWMM sewer model nodes and conveyance links to include the Mellon Park stormwater system recorded in as-built drawings.

2. We separated the large tributary catchment area into tributary subcatchments to the various SWMM collection nodes. The resultant Enhanced SWMM model will be considered the baseline condition for comparison purposes.

3. Do we build on top of the baseline? A second model of a proposed condition establishing generic storage nodes in the Enhanced SWMM model at the topographic low point of the Mellon Park parcels to assess the A42 sewer system response to various generic storage volumes. For the initial analysis, the corresponding storage node will be inserted “in-line” on an existing combined sewer pipe immediately downstream of the Park at a location where all upslope Mellon Park Basin subcatchments are tributary.

The insertion of an “in-line” storage node is intended to provide a simplified high-level approach to screening potential storage options. However, this connection method does not represent a viable real-world GSI installation method in combined sewer areas. Therefore, as the analysis progressed and specific GSI locations were established, we moved the storage nodes “off-line,” capturing surface runoff only, with overflow connections back into the existing combined sewer (see next steps below).

3. Perform SWMM Model Sensitivity Analysis:

With the enhanced SWMM models, we performed a sensitivity analysis for various levels of tributary runoff capture, from 0% to 100% capture in 10% storage volume increments. The 0% storage scenario is the baseline condition with no provisions for storage. The 100% capture scenario provides the tributary 95th percentile rainfall event storage.

As the specific goal of GSI projects in combined sewer areas is to attenuate combined sewer overflows to rivers and mitigate local flooding, specific modeling output values will be referenced to characterize the SWMM model’s response to various levels of storage. These sensitivity analysis output metrics for the typical year of rainfall in the A42 sewershed will include:

1. Outfall Loading, MH122E001-OF (To River), which equates to the annual A42 CSO to River

2. Flooding Loss, Volume that represents the annual A42 surface flooding volume

A cost-benefit analysis was performed to select the most efficient alternative.

From PWSA “GI Scoring Ranking 10-11-19 DRAFT” spreadsheet provided for the A41 and A42 sewershed planning analysis, the GSI solutions range from $1 to $10 per gallon of storage, with an average of $6.40. A typical R-tank project of 1,000 gallons is presented by ACF environmental in his “R-Tank-Design-Tool-v3.0-March-2018” spreadsheet with a cost of $6.15 per gallon. We assumed a GSI project cost of $6.14 per storage gallon based on the above values. An additional cost is considered as the rate ALCOSAN incurred to treat the additional volume sent to the plant due to the improvement project. We used the charge reported on the ALCOSAN website (https://www.alcosan.org/our-customers/understanding-your-bill) of $9.10 per 1,000 gallons.

For the benefits that ALCOSAN can see, we used the results from the last GROW cycle. In the last GROW cycle, the minimum payment in a funded project was $0.23 per gallon of CSO reduction, and the minimum match was 15.53%. Therefore, we assume a conservative value of $0.20 per gallon of CSO reduction and a minimum match of 15% from the above results. Additionally, flooding can damage roads and infrastructure with depths as low as 1”. We considered a replacement cost of $15 per yard, with an additional 10% cost for additional damage. The cost per gallon of the flood was computed at $1.47. Therefore, we used a value of $1.5 per gallon of flood reduced.

For the benefits that PWSA can see, we used the “GI Scoring Ranking 10-11-19 DRAFT” spreadsheet; a project with a capital cost of $150,000 per impervious acre managed is scored with the maximum points, making it possible more likely to be funded. Therefore, the above ratio corresponds to $3.68 per gallon of the volume from the impervious area managed.

Applying the above cost and benefit costs, the highest storage that overpassed a threshold cost-benefit of 1 was the option with the 20% capture volume. The associated 20% capture of the 95th percentile rainfall-runoff (from the Mellon Park Basin) was approximately 1.765 MG (235,910 cf) – this correlates to an SWMM storage node volume of 229,779 cf.

The following is a summary of the selected alternative results:

1. Annual Reduction in Surface Flooding = 0.905 MG (derived from Flooding Loss)
2. Annual Reduction in CSO to River = 18.102 MG
3. Annual Increase to ALCOSAN WWTP = 17.605 MG

Table 1. Input comparison for the storage scenarios on the sensitivity analysis.

MODEL INPUT	BASELINE	STORAGE SCENARIOS									
Model Simulations	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Cumulative Storage Volume Provided (Feet^3)	0	117955	235910	353865	471820	589775	707730	825685	943640	1061595	1179550
Cumulative Storage Volume Provided (10^6 gal)	0	0.882	1.765	2.647	3.529	4.412	5.294	6.177	7.059	7.941	8.824
Dry Weather Inflow Volume(10^6 gal)	0	0	0	0	0	0	0	0	0	0	0
Wet Weather Inflow, Volume(10^6 gal)	1581.357	1581.337	1581.339	1581.335	1581.344	1581.338	1581.34	1581.342	1581.342	1581.341	1581.343
Groundwater Inflow, Volume(10^6 gal)	0	0	0	0	0	0	0	0	0	0	0
RDII Inflow, Volume(10^6 gal)	310.081	310.08	310.08	310.08	310.08	310.08	310.08	310.08	310.08	310.08	310.08
External Inflow, Volume(10^6 gal)	3811.75	3811.749	3811.749	3811.75	3811.75	3811.75	3811.75	3811.75	3811.75	3811.75	3811.75
U/S Impervios Area (acre)	92.825	92.825	92.825	92.825	92.825	92.825	92.825	92.825	92.825	92.825	92.825
Min. Tributary Impervious Area to Fill Storage (acres)	0	9.271764	18.543528	27.815292	37.087056	46.35882	55.630584	64.902348	74.174112	83.445876	92.71764
Min. Tributary Sewershed to Fill Storage (acres)	0	21.663	43.326	64.989	86.652	108.315	129.978	151.641	173.304	194.967	216.63

The selected scenario provided management of 20% of the 95th percentile rainfall runoff volume. The corresponding annual reduction in surface flood volume and combined sewer overflow were **0.905 MG** and **18.102 MG**, respectively. These results are preliminary and will be further refined when the storge is distributed to the various GSI locations and the storage nodes moved “off-line” from the existing combined sewer piping.

Table 2. Output comparison for the storage scenarios on the sensitivity analysis

MODEL OUTPUT	BASELINE	STORAGE SCENARIOS									
Model Simulations	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Flooding Loss, Volume (10^6 gal)	34.744	34.55	33.839	33.863	33.878	33.918	33.984	33.991	34.026	34.095	34.087
Outfall Loading, A-41-DT-SD (To Treatment Plant), Volume (10^6 gal)	4332.017	4345.054	4349.622	4350.244	4350.733	4350.392	4350.505	4352.528	4353.376	4351.918	4353.9
Outfall Loading, MH122E001-OF (To River), Volume (10^6 gal)	1441.882	1428.19	1423.78	1417.727	1416.388	1416.546	1414.005	1412.884	1413.792	1410.996	1413.091
Total Outfall Loading, Flow (10^6 gal)	5808.643	5807.794	5807.241	5801.834	5800.999	5800.856	5798.494	5799.403	5801.194	5797.009	5801.078
Full Both Ends (Conduits U/S, Hour)	4683.97	6387.04	5235.28	4794.91	4600.6	4516.86	4464.65	4427.82	4414.93	4413.02	4423.47
Above Full Normal (Conduits U/S, Hour)	1471.65	1704.08	1720.18	1721.84	1721.65	1720.42	1717.78	1714.33	1711.73	1708.55	1706.67
Full Both Ends (Conduits D/S, Hour)	6429.68	6423.66	6421.4	6414.59	6411.95	6402.15	6391.31	6399.82	6409.08	6398.67	6421.26
Above Full Normal (Conduits D/S, Hour)	1210.88	1274.89	1272.14	1261.08	1259.45	1245.82	1238.13	1242.13	1238.34	1230.74	1232.07
D/S Node (MH084M027), Total Inflow (MG)	57.70	57.12	57.91	57.94	57.94	57.89	57.85	57.80	57.76	57.71	57.68

Notes:

- Flooding Loss, Volume (10^6 gal) correlates to surface flooding
- Outfall Loading, MH122E001-OF (To River), volume (10^6 gal) correlates to CSO volume

4. Delineate Anticipated Capture Area

We computed the sewershed capture area that correlates to the optimized GSI storage volume obtained during the sensitivity analysis. The area was delineated from the closest upstream drainage area to Mellon Park. The Managed Subcatchments area to GSI was around 63 acres.

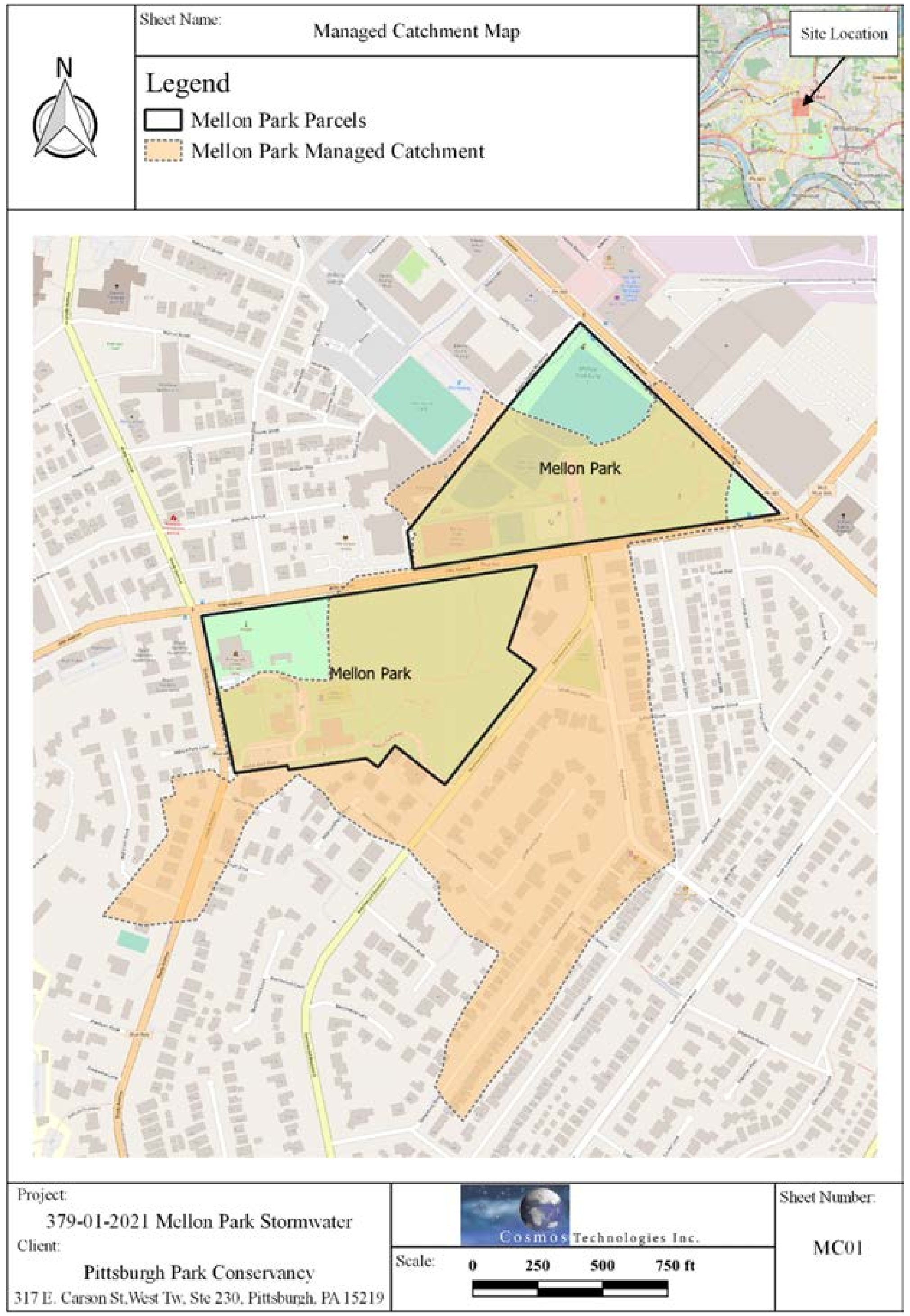

Figure 2. Managed Catchment Map.

5. Distribute GSI Storage Volumes:

For further refinement of the selected alternative, we distributed the footprint area of Proposed GSI Storage in nine (9) locations around Mellon park. The proposed distribution in GSI features is presented in the table below:

Table 3. Storage area distribution.

Node	Storage Area, 50% Void Space (sf)	Storage Volume (gallons)	Estimated Construction Cost	Location
SU1	37,264.58	696,894.17	$4,278,930.20	Field 1 outfield
SU2	11,116.93	207,900.45	$1,276,508.74	North Side Parking Lot
SU3	6,882.86	128,718.07	$790,328.96	Rectangular Field
SU4	14,560.02	272,290.62	$1,671,864.42	Community Green and Basketball courts
SU5	5,969.22	111,631.79	$685,419.16	South Side - upper parking area (garden center)
SU6	3,251.60	60,808.91	$373,366.70	South side – middle parking area (walled garden)
SU7	4,050.90	75,756.81	$465,146.83	South Side – lower parking area (Marshall Mansion)
SU8	6,244.53	116,780.51	$717,032.32	Olmstead Pond
SU9	5,023.38	93,943.43	$576,812.67	Beechwood Blvd
TOTALS	94,364.00	1,764,724.76	$10,835,410.00	

6. Refine SWMM Model with Distributed/Optimized GSI Storage:

The refined SWMM model was run and compared against the baseline with the distributed storage nodes.

A summary of the baseline results is shown below:

1. Existing runoff volume (wet weather flow) originating from the tributary area to Mellon Park (SWMM typical year, all subcatchmnets observed upstream of MH084M027, includes system surcharging/surface flooding) = 90.35 MG

2. Existing runoff volume (wet weather flow) from the tributary area to Mellon Park captured/conveyed by the combined sewer (SWMM typical year, observed at MH084M027) = 57.7 MG

3. Existing peak flow rate from the Mellon Park tributary sewershed as conveyed by the combined sewer (SWMM typical year, observed downstream of MH084M027) = 30.653 MGD

4. Estimate of existing runoff volume originating from Mellon Park limits:

    1. For the 95th Percentile Rainfall Event (Total Area = 32.37 acres, Impervious = 6.90 acres, 95th percentile rainfall = 1.66-inch, SSHM) = ((6.90 ac x 0.99) + (25.47 ac x 0.24)) x (43560 sf/ac) x 1.66 in x (1 ft/12in) = 77,997 cf (583,456 gal)

    2. For the Typical Year (Total Area = 32.37 acres, Impervious = 6.90 acres, Annual rainfall depth = 37.55 inches, SSHM) = ((6.90 ac x 0.99) + (25.47 ac x 0.24)) x (43560 sf/ac) x 37.55 in x (1 ft/12in) = 1,764,324 cf (13.20 MG)

A summary of the results with the distributed GSIs is shown below:

1. Proposed runoff volume (wet weather flow) originating from the tributary area to Mellon Park (SWMM typical year, all subcatchmnets observed upstream of MH084M027, includes system surcharging/surface flooding) = 90.35 MG
2. Proposed runoff volume (wet weather flow) from the tributary area to Mellon Park captured/conveyed by the combined sewer (SWMM typical year, observed at MH084M027) = 62.8 MG
3. Proposed peak flow rate from the Mellon Park tributary sewershed as conveyed by the combined sewer (SWMM typical year, observed downstream of MH084M027) = 23.513 MGD
4. Total Available GSI Stormwater Storage Volume in the Park (calculated from the total area in Table 3 multiplied by an average of 5 feet depth and 50% void volume) = 235,910 cf (1.765 MG)

A summary of benefits obtained with the distributed GSI is shown below:

1. The reduction in runoff volume for the tributary area to Mellon Park (SWMM typical year, observed at MH084M027, no modeled GSI infiltration) was 0.00 MG. This is because the model assumes no infiltration and no evaporation. This conservative approach to the model is consistent with the ALCOSAN's modeling protocols for the GROW grant program when no infiltration data is provided. However, it can not be proved that no adverse infiltration effects will occur downstream.
2. Reduction in peak flow rate from the Mellon Park tributary sewershed as conveyed by the combined sewer (SWMM typical year, observed downstream of MH084M027) = 7.14 MGD
3. Annual Reduction in Surface Flooding = 5.15 MG
4. Annual Reduction in CSO to River = 8.33 MG
5. Annual Increase to ALCOSAN WWTP = 8.86 MG

Figure 3 shows a snapshot of the SWMM model for the proposed stormwater management project.

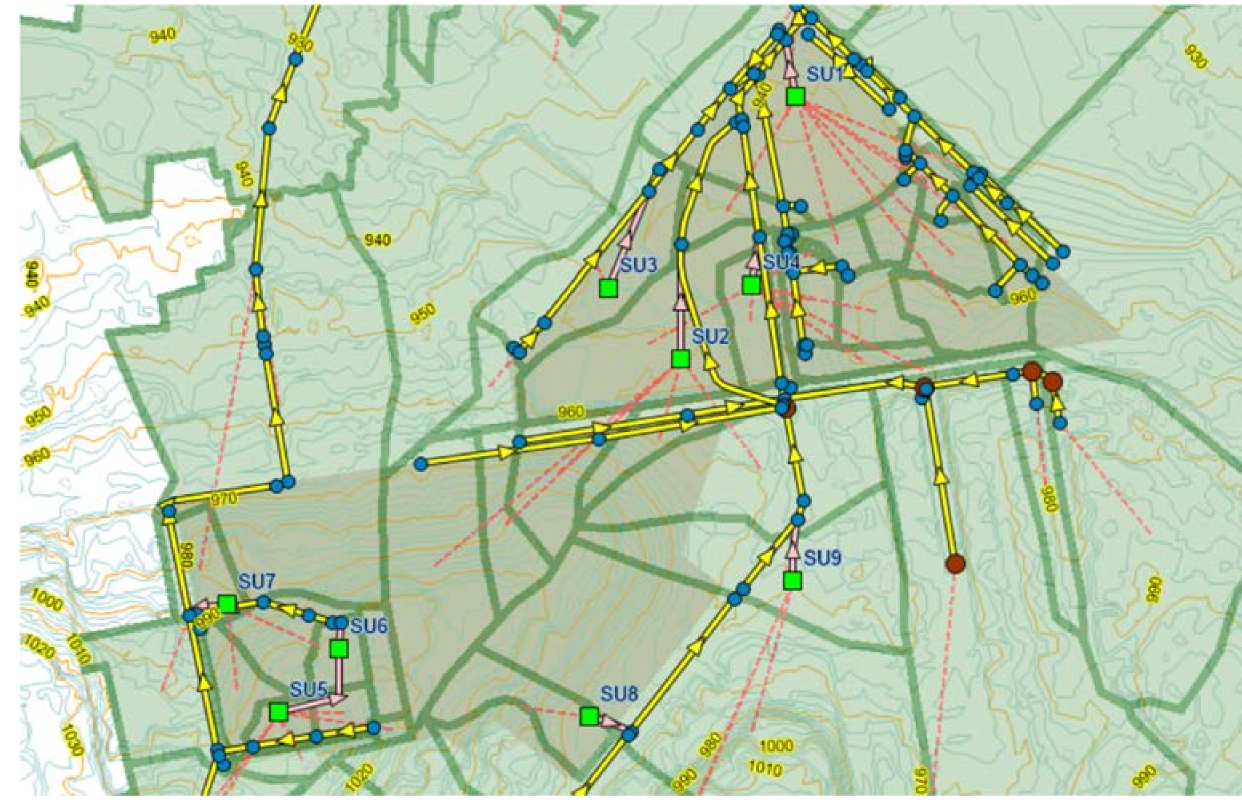

Figure 3. Proposed model snapshot.

7. Assess GSI Funding Methodology

We performed a GSI cost/performance analysis to assess potential funding opportunities. The costing was based on available data. Acknowledging that this analysis is a rough estimate, we assumed a conservative approach to the values provided (see Table 4).

As explained in Point 3, the capital cost of the GSIs was estimated at $6.14 per storage gallon. Therefore, the recommended storage yields a total construction cost of $10,835,402.19. Based on an analysis of the benefits provided by the project and the impervious acres managed, we believe that the cost-sharing by ALCOSAN and PWSA could contribute up to $9,305,374 and $2,781,523, respectively, to the capital costs.

Looking at the benefits of the projects, we used an annual CSO flooding reduction value of $0.20 per gallon and an annual flooding reduction benefit of $1.5 per gallon. In addition, by managing more stormwater on the Mellon Park parcels, we will also be sending more water to the treatment plan, which costs $9.10 per 1,000 gallons treated. Using these numbers, we calculate a net benefit of the project of $9,305,374.00 per year (or $5.27 per gallon of storage each year):

Annual Flooding Reduction (5.15 MG x $1.5 per gallons) =	$7,719,000
Annual Treatment Cost Increase (8.86 MG x $9.10/1,000 gallons) =	$(80,626)
Annual CSO Reduction (8.33 MG x $0.20/gallon)+	$1,667,000
Net Benefit of Storage Proposed	$9,305,374

Given the regional benefit that will result from the proposed level of storage, cost-sharing by ALCOSAN and PWSA should be pursued.

Typically GROW grant funding only accounts for the benefit of CSO reduction and not flood relief. However, if ALCOSAN were to fund in an amount equal to both benefits, their contribution could be as high as $9,305,374, with a funding benefit factor of 86%. If, however, they were to follow past practice and only calculate a benefit based on CSO reduction, a cost-sharing of $1,586,374 would be anticipated (Value of CSO reduction – additional treatment costs). The latter approach would only yield a funding factor of 15% (below the ALCOSAN threshold).

The project will also benefit PWSA, so PWSA funding may be available to complement possible ALCOSAN funding. Using that rate to value the benefits of the projects, PWSA could contribute $2,781,523, covering the remaining cost of the project.

Suppose ALCOSAN pays only for CSO reductions, as happens in most projects presented to the GROW program. In that case, the benefit factor will reduce to 15%, making it unlikely that the GROW program would fund the project. Although we can still request PWSA support, the project will need extra funding of around $8,053,879.

Table 4. Cost/performance analysis.

	With Flooding Benefits	Without Flooding Benefits
ALCOSAN Funding		
Flooding Reduction Credit (A)	$7,719,000.00	$0
Treatment Cost (B)	$(80,626.00)	$(80,626.00)
CSO Reduction Credit (C)	$1,667,000.00	$1,667,000.00
Total Credit (A+B+C)	$9,305,374.00	$1,586,374
Benefit per gallon ($ Capital/Gallon)	$5.27	$0.90
Construction Cost of GSI (Storage Volume)	$10,835,402.19	$10,835,402.19
ALCOSAN Funding Factor ($ Credit/$ Const.)	0.86	0.15
Supplemental Funding Required	$1,530,028.19	$9,249,028.19
PWSA Funding		
PWSA Credit, $ per Gallon (Equivalent Impervious Managed) (1.76 MG x $3.68/ gallon)	$2,781,522.79	$2,781,522.79
PWSA Funding Available/Funding Required	1.82	0.30

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TRAFFIC TECHNICAL MEMO

Technical Memo

May 24, 2022

Project Name: Mellon Park Action Plan – Traffic Engineering Services

Project Number: C-41354

Prepared By: Michael J. Haberman, P.E.

Introduction

The Gateway Engineers, Inc. (Gateway) was retained by the Pittsburgh Park Conservancy (PPC) to perform traffic engineering services and analyses in and around Mellon Park, which is located along Fifth Avenue and Beechwood Boulevard in the Shadyside neighborhood of the City of Pittsburgh. Tasks performed included intersection review and analyses, concept development, and preferred plan development. The following sections of this memo summarize work performed for each of these tasks.

Intersection Review and Analyses

On-site observations were conducted at the intersections of Penn Avenue & Bakery Square Boulevard; Penn Avenue & Fifth Avenue; Fifth Avenue & Beechwood Boulevard / Mellon Park Drive; and Fifth Avenue & Shady Avenue. In addition to observing traffic operations at these intersections, data was collected at the intersection of Fifth Avenue & Beechwood Boulevard / Mellon Park Drive during a weekday evening peak period and on a Saturday midday peak period. The data was collected using MioVision cameras which provided a breakdown of pedestrians, bicycles, and vehicles at the intersection. Lastly, Gateway performed general field measurements (lane widths, approach grades, signage, etc.) were also performed throughout the study area.

The site observations, field measurements, and traffic data were utilized to analyses the study area and to develop existing conditions base mapping of the traffic infrastructure adjacent to Mellon Park. The study area was then modeled using Synchro Software and analyzed to identify potential modifications to the roadway system, lane configurations, traffic control, signage, and other infrastructure features to improve safety for pedestrians and bicyclists while also not significantly impacting vehicle operations.

Several options were considered and analyses with relation to the study area. Analyses included evaluating reducing Fifth Avenue from a 4-lane section to a 3-lane section with bike lanes; however, the model revealed that the existing vehicular traffic during the peak times could not be accommodated with the removal of a through lane in each direction on Fifth Avenue. The analyses show that the intersections would drop to Level-of-Service F with significant delays and queues during peak times.

In addition to evaluating the potential reduction of lanes on Fifth Avenue, Beechwood Boulevard was evaluated to determine if the auxiliary right turn lane could be eliminated from the approach to Fifth Avenue. As was the case with the evaluation of Fifth Avenue, the removal of this auxiliary turn lane would result in excessive delays and queues on Beechwood Boulevard during peak times.

Upon determining that reducing the number of vehicular lanes at critical intersections and along Fifth Avenue was not a feasible alternative, Gateway's focus turned to identifying traffic calming and infrastructure improvements throughout the study area that could be implemented to reduce conflicts between pedestrians, bicycles, and vehicles as well as reduce speeds and improve safety throughout the study area. Several concepts were developed and vetted between Gateway, PPC, DOMI, and other stakeholders in order to develop a final preferred plan for future traffic improvements.

A FULL-SERVICE CIVIL ENGINEERING FIRM

Technical Memo

May 24, 2022

Concept Development

Existing base mapping was developed from the field measurements and aerial photography. The base mapping was utilized to develop a series of traffic calming improvements and upgrades to pedestrian and bicycle infrastructure throughout the study area. In order to determine feasible traffic calming improvements, PennDOT Publication 383, *Pennsylvania's Traffic Calming Handbook* was reviewed and evaluated. From this review and evaluation of existing conditions, several traffic calming measures and treatments were developed and were recommended for inclusion in the Mellon Park Action Plan. Concepts were developed for the following improvements, which were recommended for inclusion in the final Action Plan:

- Realign and reconstruct the access to the north side of Mellon Park opposite Beechwood Boulevard.
- Install a new traffic signal with an exclusive pedestrian phase at the intersection of Fifth Avenue and Beechwood Boulevard, including new ADA ramps on each corner.
- Install bulb-outs, new curbing, new pedestrian crossings, bike lanes, and other traffic calming features on Beechwood Boulevard between Fifth Avenue and West Lyndhurst Drive. Bulb-outs to incorporate stormwater management features and pervious areas (grass, plantings, rain gardens, etc.).
- Install speed humps and raised crosswalks along Beechwood Boulevard at locations between Reynolds Street and West Lyndhurst Drive. Install associated pavement markings and signage at each speed hump / raised crosswalk location.
- Realign and narrow the Reynolds Street approach to Beechwood Boulevard, including the construction of new sidewalks, curbing, ADA ramps, pavement markings, signage, and defined travel lanes and parking.
- Install updated pedestrian signal equipment (walk/don't walk with countdown timers, push buttons, etc.) at the signalized intersection of Fifth Avenue and Shady Avenue as well as at the intersection of Penn Avenue and Fifth Avenue.

Preferred Plan / Costs

The improvements outlined above and depicted on the concepts included in the final Mellon Park Action Plan are recommended for future consideration as funding becomes available and as the remainder of the plan for the north and south sides of Mellon Park are pursued. Gateway developed detailed cost estimates for the improvements depicted on the concept plans and outlined above. The following is a breakdown of the costs associated with these traffic improvements:

- Construction costs: $865,000
- Contingency (20%): $175,000
- Survey / Design / Permitting: $100,000
- **TOTAL: $1,140,000**

A FULL-SERVICE CIVIL ENGINEERING FIRM

Memo

May 24, 2022

Project Name: **Mellon Park Action Plan – Traffic Improvement Summary**

Project Number: **C-41354**

Prepared By: **Michael J. Haberman, P.E.**

General Summary of Improvements

The Gateway Engineers, Inc. (Gateway) was retained by the Pittsburgh Parks Conservancy (PPC) to perform traffic engineering services related to the development of an Action Plan for Mellon Park in the Shadyside neighborhood of the City of Pittsburgh. Upon review of existing conditions and through a series of meetings and discussions, an improvement plan was developed. The improvements includes a series of traffic calming measures and traffic signal upgrades to encourage and promote safe and convenient pedestrian and bicycle access to both the north side and south side of Mellon Park while still also providing adequate infrastructure for vehicular traffic operations adjacent to Mellon Park. The following improvements have been recommended:

- Realign and reconstruct the access to the north side of Mellon Park opposite Beechwood Boulevard.
- Install a new traffic signal with an exclusive pedestrian phase at the intersection of Fifth Avenue and Beechwood Boulevard, including new ADA ramps on each corner.
- Install bulb-outs, new curbing, new pedestrian crossings, bike lanes, and other traffic calming features on Beechwood Boulevard between Fifth Avenue and West Lyndhurst Drive. Bulb-outs to incorporate stormwater management features and pervious areas (grass, plantings, rain gardens, etc.).
- Install speed humps and raised crosswalks along Beechwood Boulevard at locations between Reynolds Street and West Lyndhurst Drive. Install associated pavement markings and signage at each speed hump / raised crosswalk location.
- Realign and narrow the Reynolds Street approach to Beechwood Boulevard, including the construction of new sidewalks, curbing, ADA ramps, pavement markings, signage, and defined travel lanes and parking.
- Install updated pedestrian signal equipment (walk/don't walk with countdown timers, push buttons, etc.) at the signalized intersection of Fifth Avenue and Shady Avenue as well as at the intersection of Penn Avenue and Fifth Avenue.

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NORTH
GATEWAY
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Pittsburgh, PA
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gatewayengineers.com
SEE SHEET CON-6
SEE SHEET CON-4
SEE SHEET CON-3
SEE SHEET CON-5
SEE SHEET CON-1
SEE SHEET CON-2
REVISION RECORD
Date
No
01
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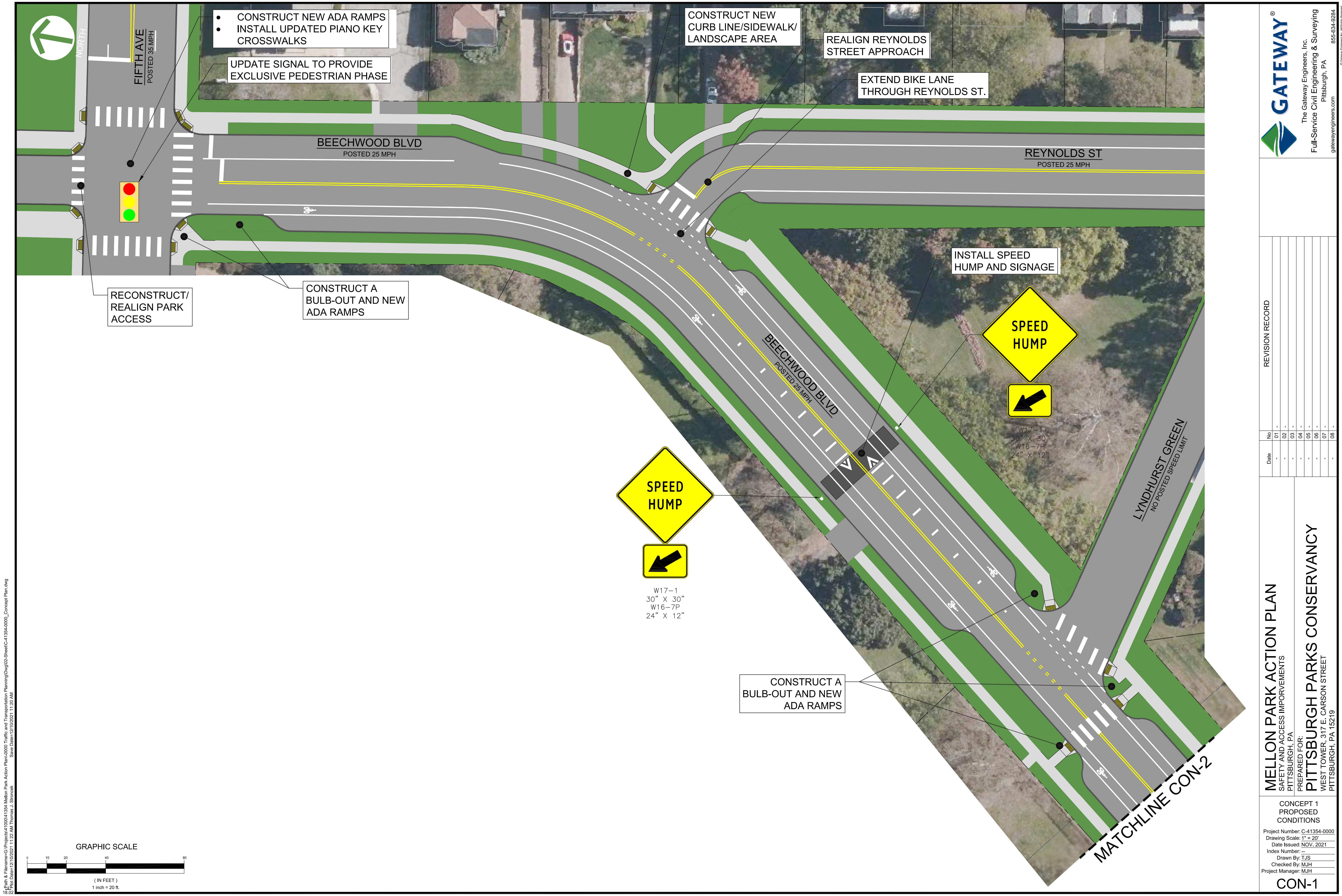
MELLON PARK ACTION PLAN
SAFETY AND ACCESS IMPORVEMENTS
PITTSBURGH, PA
PREPARED FOR:
PITTSBURGH PARKS CONSERVANCY
WEST TOWER, 317 E. CARSON STREET
PITTSBURGH, PA 15219
OVERALL SITE INDEX
GRAPHIC SCALE
0
50
100
200
400
(IN FEET)
1 inch = 100 ft.
Project Number: C-41354-0000
Drawing Scale: 1" = 100'
Date Issued: NOV. 2021
Index Number: --
Drawn By: TJS
Checked By: MJH
Project Manager: MJH
OVERALL



NORTH
FIFTH AVE
POSTED 35 MPH
CONSTRUCT NEW ADA RAMPS
INSTALL UPDATED PIANO KEY CROSSWALKS
UPDATE SIGNAL TO PROVIDE EXCLUSIVE PEDESTRIAN PHASE
CONSTRUCT NEW CURB LINE/SIDEWALK/ LANDSCAPE AREA
REALIGN REYNOLDS STREET APPROACH
EXTEND BIKE LANE THROUGH REYNOLDS ST.
BEECHWOOD BLVD
POSTED 25 MPH
REYNOLDS ST
POSTED 25 MPH
RECONSTRUCT/ REALIGN PARK ACCESS
CONSTRUCT A BULB-OUT AND NEW ADA RAMPS
INSTALL SPEED HUMP AND SIGNAGE
SPEED HUMP
BEECHWOOD BLVD
POSTED 25 MPH
SPEED HUMP
W17-1
30" X 30"
W16-7P
24" X 12"
LYNDHURST GREEN
NO POSTED SPEED LIMIT
CONSTRUCT A BULB-OUT AND NEW ADA RAMPS
MATCHLINE CON-2
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
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Date
No
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WEST TOWER, 317 E. CARSON STREET
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CONCEPT 1
PROPOSED
CONDITIONS
Project Number: C-41354-0000
Drawing Scale: 1" = 20'
Date Issued: NOV. 2021
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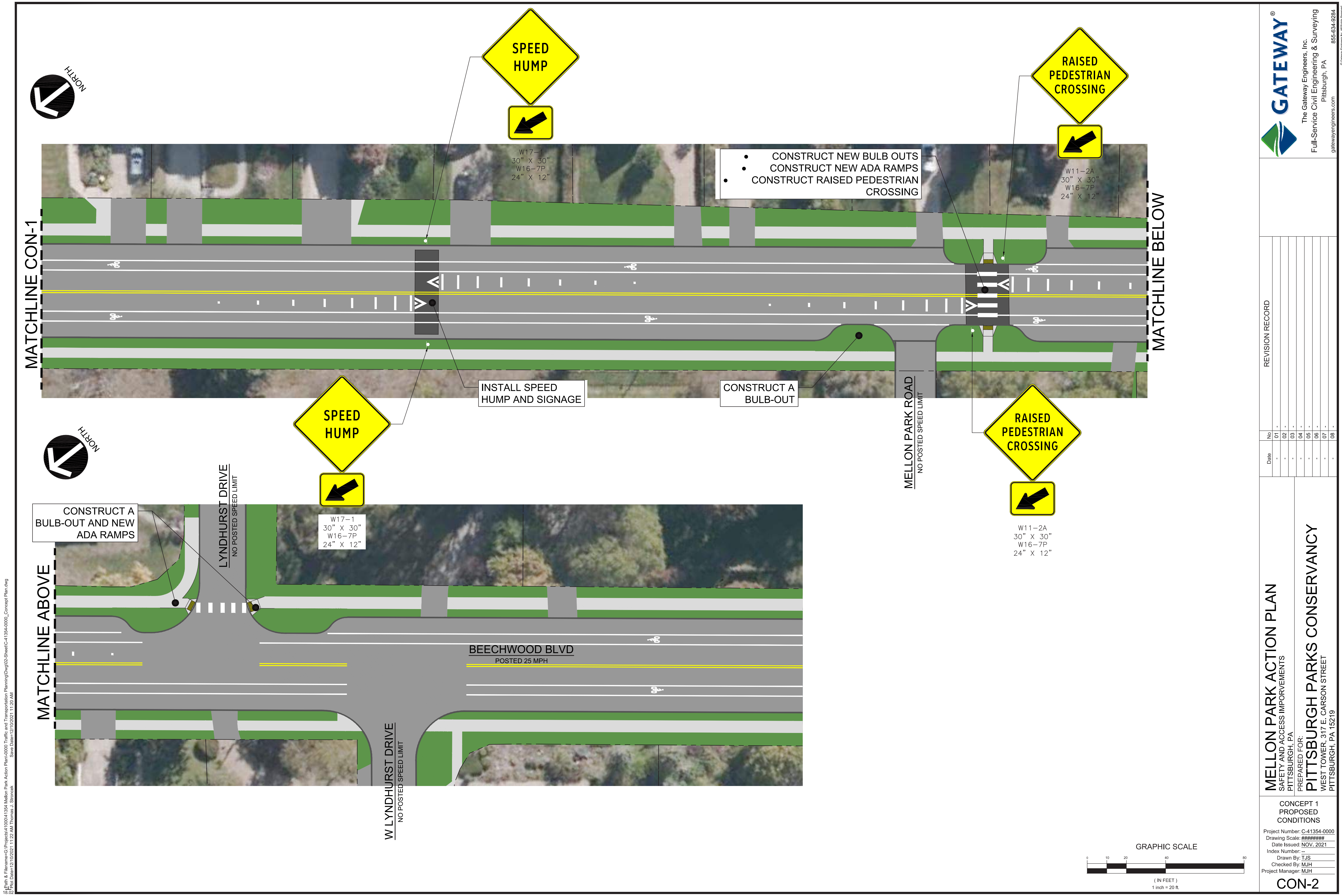
CON-1



NORTH
SPEED HUMP
W17-1 30" X 30"
W16-7P 24" X 12"
CONSTRUCT NEW BULB OUTS
CONSTRUCT NEW ADA RAMPS
CONSTRUCT RAISED PEDESTRIAN CROSSING
RAISED PEDESTRIAN CROSSING
W11-2A 30" X 30"
W16-7P 24" X 12"
MATCHLINE CON-1
MATCHLINE BELOW
INSTALL SPEED HUMP AND SIGNAGE
CONSTRUCT A BULB-OUT
MELLON PARK ROAD
NO POSTED SPEED LIMIT
SPEED HUMP
RAISED PEDESTRIAN CROSSING
CONSTRUCT A BULB-OUT AND NEW ADA RAMPS
LYNDHURST DRIVE
NO POSTED SPEED LIMIT
MATCHLINE ABOVE
BEECHWOOD BLVD
POSTED 25 MPH
W LYNDHURST DRIVE
NO POSTED SPEED LIMIT
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
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CONCEPT 1 PROPOSED CONDITIONS
Project Number: C-41354-0000
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Date Issued: NOV. 2021
Index Number: --
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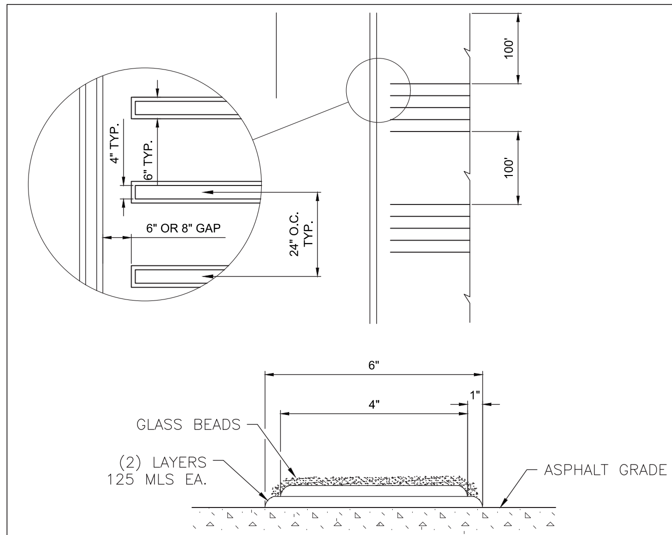
Project Manager: MJH
CON-2

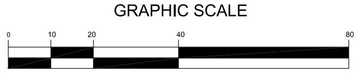
R2-1
24" X 30"



TRANSVERSE MARKINGS DETAIL
N.T.S.

RECOMMENDATIONS:
- REDUCE SPEED LIMIT TO 25 MPH EAST OF SHADY.
- INSTALL TRANSVERSE MARKINGS.

GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.

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MELLON PARK ACTION PLAN
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PITTSBURGH, PA
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PROPOSED
PAVEMENT MARKINGS
AND SIGNAGE

Project Number: C-41354-0000
Drawing Scale: 1" = 20'
Date Issued: NOV. 2021
Index Number: --
Drawn By: TJS
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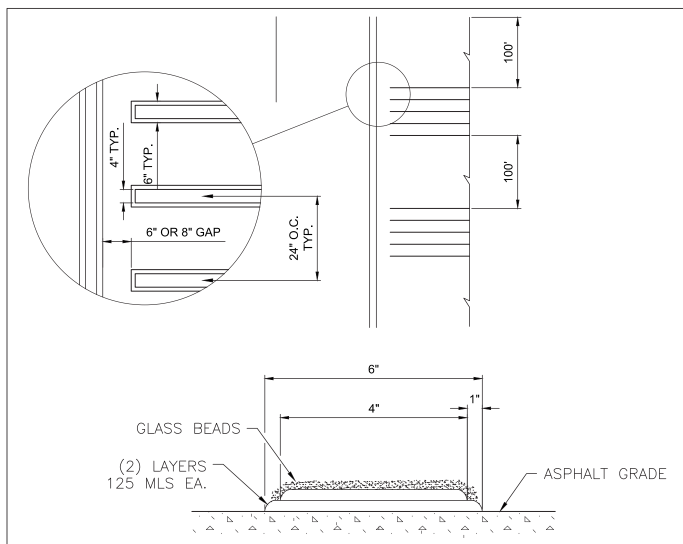
Project Manager: MJH

CON-3

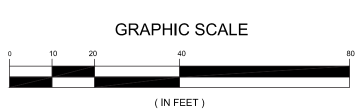


TRANSVERSE MARKINGS DETAIL

N.T.S.

RECOMMENDATIONS:

- INSTALL TRANSVERSE MARKINGS.



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REVISION RECORD

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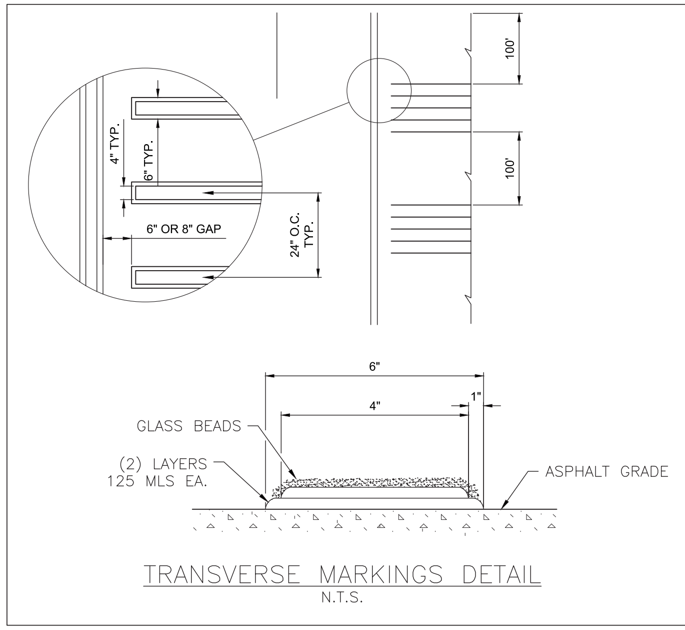
MELLON PARK ACTION PLAN
SAFETY AND ACCESS IMPORVEMENTS
PITTSBURGH, PA

PREPARED FOR:
PITTSBURGH PARKS CONSERVANCY
WEST TOWER, 317 E. CARSON STREET
PITTSBURGH, PA 15219

PROPOSED PAVEMENT MARKINGS AND SIGNAGE

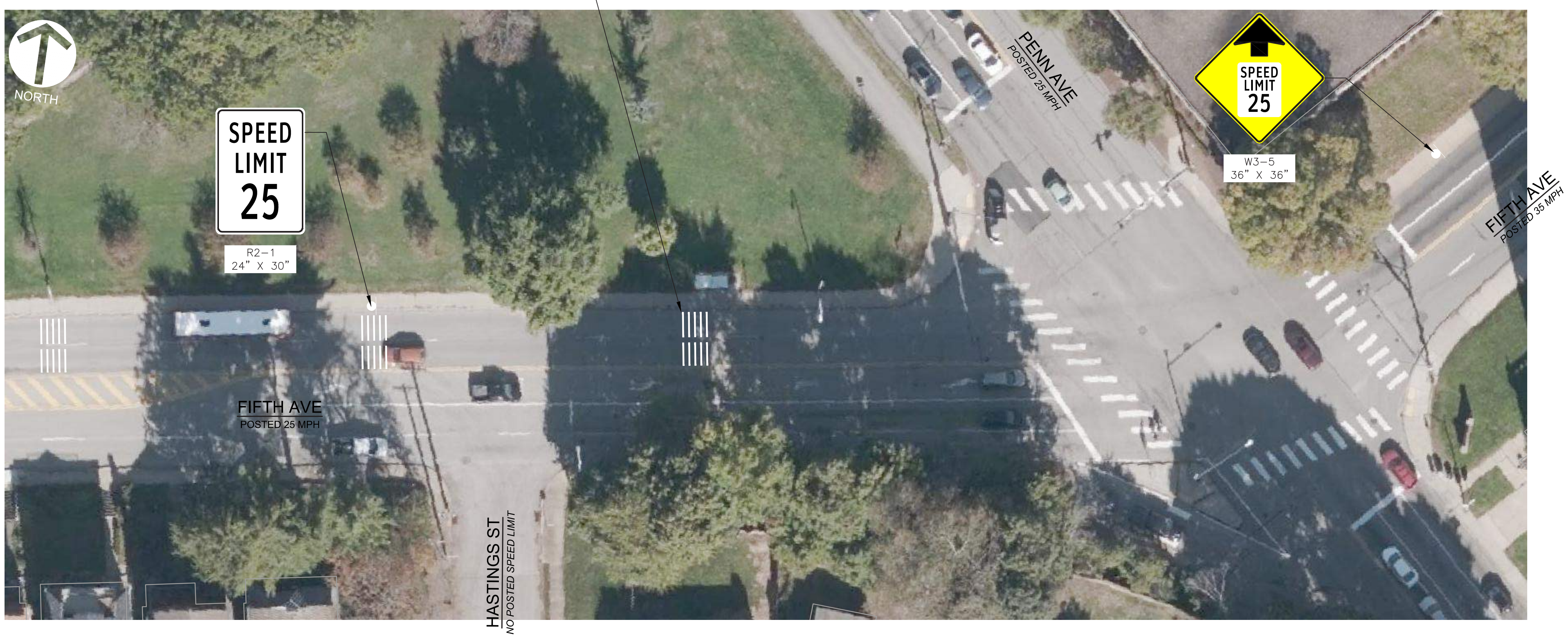
Project Number: C-41354-0000
Drawing Scale: 1" = 20'
Date Issued: NOV. 2021
Index Number: --
Drawn By: TJS
Checked By: MJH
Project Manager: MJH

CON-5



RECOMMENDATIONS:

- REDUCE SPEED LIMIT TO 25 MPH EAST OF SHADY.
- INSTALL TRANSVERSE MARKINGS.



GRAPHIC SCALE

0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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MELLON PARK ACTION PLAN
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PROPOSED PAVEMENT MARKINGS AND SIGNAGE

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Project Manager: MJH

CON-6

Pittsburgh
Parks
Conservancy

evolve
environment :: architecture

Cosmos
TECHNOLOGIES

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ENGINEERS

ForeGround
Consulting