

March 2014

Rev. April 2014

Lower Hill Infrastructure Project

**Allegheny County
City of Pittsburgh**

Design Field View Narrative

Prepared for:

Sports and Exhibition Authority



Sports & Exhibition Authority

When you have the time, Pittsburgh has the place.

Prepared by:

Baker

Michael Baker Jr., Inc.
100 Airside Drive
Moon Township, PA 15108

Lower Hill Infrastructure Project

**ALLEGHENY COUNTY
CITY OF PITTSBURGH**

DESIGN FIELD VIEW NARRATIVE

TABLE OF CONTENTS

A. Introduction..... 1

B. Design Field View Narrative 1

 1. Required Design Exceptions..... 1

 2. Maintenance and Protection of Traffic Narrative 2

 3. Roadway Lighting Warrants..... 2

 4. Traffic Signal Warrants 2

 5. Structure Design Considerations 3

 6. Environmental Mitigation Commitments 3

 7. Outstanding Issues 3

 8. Significant Utility Issues 4

 9. Significant Right-of-Way Issues..... 4

 10. Alignment Book..... 5

 11. Preliminary Hydraulics 5

 12. Cost Estimate 5

 13. Recommended Contracting Method 5

 14. Pre-Bid Construction Schedule..... 5

 15. Other Project Items..... 5

Appendix A – Project Design Criteria

Appendix B – Construction Cost Estimate

LOWER HILL INFRASTRUCTURE PROJECT

ALLEGHENY COUNTY CITY OF PITTSBURGH

DESIGN FIELD VIEW NARRATIVE

A. Introduction

The purpose of this project is to establish the infrastructure associated with redevelopment of the former Civic Arena site. In addition to establishing the street grid system internal to the site bounded by Crawford Street to the west, Washington Place to the east, Bedford Avenue to the north and Centre Avenue to the south, the project will establish the right-of-way associated with each of the developable parcels created by the street grid system as well as the improvements of the perimeter roadways associated with the site. The project is located entirely within the City of Pittsburgh, Allegheny County.

The design is based on the Lower Hill Special Planning Zoning District and the Lower Hill Preliminary Land Development Plan (PLDP), both available upon request after approval by City Council. The Lower Hill Site Redevelopment will be an important part of defining Pittsburgh's future. The goal is to create a new, high quality, mixed-use, sustainable development that will establish a renewed connection between downtown Pittsburgh and the Hill District.

The topography of the site changes significantly, and special attention was given to the alignments and grades of the streets relative to the anticipated use as well as relative to the location of public spaces to allow for an accessible public realm. The streets within the site are laid out to work with the challenging grades while providing reasonable development blocks. The street types range in function which is reflected in the widths of both the roadways, sidewalks and landscape conditions to promote the intended street character. All streets will be two-way traffic with on-street parking. Despite the steep topography, several streets are designed to be 5% slope or less which play a critical role in managing stormwater and help meet the requirement to capture the 95th percentile runoff on site. Site-wide innovative stormwater techniques are incorporated to reduce, reuse, and recapture stormwater.

The following issues were investigated in accordance with PennDOT Publication 10C Design Manual 1C, Chapter 3.C.4, Deliverables and Design Field View Submission.

B. Design Field View Submission - Narrative

The following items were identified during the development of the Design Field View as having significant impact on the project. The resulting design assumptions and decisions pertinent to these items are presented and discussed below.

1. Required Design Exceptions

As the resulting roadways will be turned over to the City of Pittsburgh upon completion of construction, the roadways have been designed to comply with the City of Pittsburgh standards and where applicable, PennDOT Publication 13M, Design Manual Part 2: Highway Design, dated August 2009.

The functional classification of Street No. 1, Street No. 2, Street No. 5 and the perimeter streets (Bedford, Crawford, Centre, and Washington) is *Community Collector*. Street No.3 and Street No. 4 is classified as a *Local Street*. See Appendix A for the complete project design criteria.

There is one design exception anticipated for this project:

VERTICAL SIGHT DISTANCE:

The proposed roads are designed to fit within the existing topography and to meet the commitment of connecting Wylie from the Hill District through the site to Washington Place to re-create a grid system similar to what existed before construction of the Civic Arena. The existing adjacent streets, Bedford Avenue, Crawford Street, and Centre Avenue have vertical grades of 11.75%, 10.40% and 7.60% respectively.

The vertical curve lengths meet a design speed of at least 15 MPH (required design speed = 25 MPH). Longer length vertical curves would increase the vertical grades which need to tie into the existing topography and are “tabled” to meet ADA requirements. Lengthening the vertical curves to achieve 25 MPH would shorten the associated tangents such that the slopes of the roadway would be very severe. The current alignments are a delicate balance of the vertical curves (design speed) and vertical grades to provide pedestrian accessibility at critical locations.

2. Maintenance and Protection of Traffic

The internal street grid system will be built without affecting traffic flow along Bedford, Crawford, Centre, and Washington. The construction will be phased to maximize access to the parking within the grid system.

Short term pedestrian and vehicle detours will be performed to construct roadway aprons, utility connections, and traffic signal installations where they interface at Centre Avenue, Bedford Avenue, Washington Place and Crawford Street.

Off peak and weekend closures along with short term pedestrian and vehicle detours will be performed to construct Bedford, Crawford, Centre, and Washington.

Refer to the Traffic Control Plan set within the Design Field View plans for the sequence of construction write-up that further explains how traffic is being maintained during each phase.

3. Roadway Lighting Warrants

City of Pittsburgh approved pedestrian and street light poles, traffic signal poles, and bollards will be used. Lighting, to the extent practical, will be LEED – ND compliant and will be incorporated into this project as per the PLDP. Final design plans will be developed that will identify final pole locations, conduit routing, number and size of conductors, types of pole foundations and pole bases, power source, and miscellaneous details. Electrical detail sheets will show wiring schematic of the lighting circuits and control cabinet distribution centers.

4. Traffic Signal Warrants

TRANS Associates performed a traffic signal warrant analysis at all unsignalized

intersections for all conditions in accordance with the criteria as outlined in PennDOT Publication 212 and the MUTCD. The intersection of Street No. 1 and Centre Avenue and the intersection of Street No. 2 and Centre Avenue are identified as meeting traffic signal warrants. The existing traffic signal at the intersection of the existing Lemieux Place and Bedford Avenue will be upgraded and relocated to match the new alignment of Street No. 1.

Stop signs will be placed on the minor road approach of the new unsignalized intersections of Street No. 2/Bedford Avenue, Street No. 2/Street No. 4, Street No. 2/Street No. 3, Street No. 5/Crawford Street, Street No. 3/Center Avenue and Street No. 5/Washington Place.

The internal intersections of Street No. 5/Street No. 1 and Street No. 5/Street No.2 will be four-way stop controlled.

The complete traffic study is available upon request.

5. Structural Design Considerations

There are no structures as part of this project.

6. Environmental Mitigation Commitments

There are no anticipated environmental mitigations as part of this project.

The Environmental Document (ED) assesses the potential impacts of the proposed redevelopment of the 28-acre site of the former Civic Arena including the construction of transportation and infrastructure improvements. The subsequent full site build-out will be conducted over time in compliance with the vision of the Lower Hill Preliminary Land Development Plan (PLDP).

All site redevelopment activities for the 28-acre site will meet current PennDOT and City of Pittsburgh design standards and environmental regulations. The redevelopment of the site will be required to adhere to storm water control policies including volumetric detention and appropriate water quality concerns. Combined storm water and sewer infrastructure associated with the site will be separated, potentially providing improved quality of storm water discharges and reduced sewage flow to receiving sewage treatment plants (STP).

The full site build-out does not result in adverse impacts to natural resources (including streams, wetlands, floodplains, geologic resources, wildlife habitat, threatened and endangered species or critical habitat, parkland, and farmlands); cultural resources (including archaeological resources and historic structures); air quality or noise levels; and social and economic resources (regional and community growth, economic vitality, public facilities and services, community cohesion, environmental justice, and visual resources). Additionally, the full site build-out is not anticipated to result in reasonably foreseeable secondary or cumulative impacts to these resources.

7. Outstanding Issues

There are no outstanding issues.

8. Significant Utility Issues

New utility lines will be placed in coordination with the internal street grid system. Conflicts arise with existing utilities at the tie-in and around the perimeter as summarized by the table below.

	Buried Electric Crossings	Gas/Telephone Line Crossings	Waterline Crossings	Inlet Lateral Crossings	Combination Sewer Crossings
Washington Place at Bedford - 36" line Sewer is deep at this location	2	none	none	1	none
Washington Place at Wylie - 18" line New 18" storm sewer ties to 36" line	none	none	1	none	none
Washington Place: Wylie to Centre - 36" line	2	none	1 - major	1	none
Centre Avenue at Lemieux Street:					
Waterline - 12"	1 major	none	none	none	1
Sanitary Sewer - 8"	none	none	none	none	none
Centre Avenue at Logan Street:					
Waterline - 12"	1 major	none	none	none	1
Sanitary Sewer - 8"	none	none	none	none	none
Centre Avenue at Fullerton Street:					
Waterline - 12"	1 major	none	none	none	1
Centre Avenue at Crawford Street:	none	none	none	none	none

The existing perimeter street water, sewer, and gas infrastructure is approaching 60 years old and on the tail end of its life cycle. It is anticipated these utilities will modernize the impacts lines where impacted by the project.

The proposed tree wells on the perimeter sidewalks necessitate the relocation of a 16" PWSA water line and 10" Equitable Gas Company high pressure gas line on both Bedford and Crawford.

Construction of an 8" sanitary sewer on Crawford will be required by PWSA. All inlets on Bedford would be pulled from the combined line and connected to the separated storm. The combined line on Crawford would be converted to storm and redirected to the new Centre Ave storm.

9. Significant Right-of-Way Issues

Right-of-way for city streets will be established as part of this project and will be located at the back edge of the sidewalk as shown on the typical sections and cross sections. A formal right-of-way plan (either dedicating or vacating public right-of-way) will be prepared along with a subdivision plan.

The SEA owns the property to the west (lower lot) of an existing retaining wall and a natural buffer dividing the parking lots into an upper lot and lower lot. The upper most parking lot (Melody Tent site) that is adjacent to Crawford Street is owned by the URA. Prior to construction of the roadways, the SEA will enter into an agreement outlining the development rights to the developable portions of this property. This will be completed by

the directors/officials of the two entities which will be identified in the subdivision plan.

10. Alignment Book

An alignment book will be included with the PS&E Submission. Horizontal and vertical alignment data is shown on the attached Design Field View drawings.

11. Preliminary Hydraulics

The proposed storm system and sanitary sewer system have been design to meet PWSA and City of Pittsburgh requirements. In order to align with the stormwater management recommendations of the City's Ordinance, low impact development and green infrastructure techniques will be implemented to retain and infiltrate, evapo-transpire, and reuse rainwater in lieu of allowing it to run off. The entire site is designed to retain the first 1.2 inches of each storm event. The streetscapes will implement sustainable street techniques (bio-retention tree wells) which include stormwater planters along the sidewalk.

12. Cost Estimate

The total construction cost for the roadways and appurtenances is estimated to be \$26,701,746.

A tabulation of this estimate is included in Appendix B. The Design Field View cost estimate includes a 30% contingency amount.

The construction cost estimate does not include the following:

- Design engineering
- Construction management
- Construction inspection
- Minor utility relocations
- Right of Way acquisition

13. Recommended Contracting Method

The anticipated contracting method is standard bid procedures: design, bid, build.

14. Pre-Bid Construction Schedule

The Design Team will develop the Pre-Bid Construction Schedule in accordance with the requirements of Design Manual 1, Section 7.2.D.6, Pre-Bid Construction Schedule Process. This will be done near the PS&E submission.

15. Other Project Items

LEED-ND streets will be employed where appropriate, typically on slopes of 5% or less. The design intent of the LEED-ND Street is to capture, control, and treat the 'first-flush' of rain fall generated by the public infrastructure. During storm events, the first 1.2" of run-off generated from paved, impervious surfaces which will be captured and controlled by structured tree reservoirs.

Archaeological survey in the Lower Hill Redevelopment Project Area consisted of historic background research of the former location of the Arena and adjacent parking lots, including the examination of historic mapping depicting the development of the Lower Hill neighborhoods and their subsequent demolition for the construction of the Civic Arena. Using information gathered from historic maps and previous investigations in the project area, five mechanical trenches were excavated at various locations within the northern portion of the project area. Each trench was placed at a specific location in order to further examine property types or other map features.

The trenches excavated during the Phase I archaeological demonstrated that historic archaeological materials could be expected throughout the entire extent of Lot 2-C-300. Generally, these materials are well preserved and were encountered within the first 7.9 in below the surface of the active asphalt parking lot. Phase II archaeological investigations were performed at three sites identified during Phase I in the project area. Baker processed and analyzed the artifacts recovered from the archaeological investigation according to the *Guidelines for Archaeological Investigations*, and prepared an artifact inventory for incorporation into a Phase I/II archaeological report.

As a result of the Phase II site investigations, the site is not considered eligible for listing in the NRHP under Criteria A, B, or C since it is not associated with events that have made a significant contribution to the broad patterns of our history, is not associated with the lives of persons significant in our past, or does not embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction. The site is also not considered eligible under Criterion D due to a lack of association between a sizeable portion of the artifact assemblage and discrete cultural deposits, coupled with a small artifact assemblage resulting from an overall lack of artifact bearing deposits. Any additional excavations would produce redundant data. No additional archaeological work is required as per a letter dated December 11, 2013 from the Pennsylvania Historical and Museum Commission.

The proposed storm and drainage systems within the perimeter streets, (Bedford, Crawford, Centre, and Washington) will be installed using trenches. The surface then will be milled and overlaid to show uniformity on the surface.

APPENDIX A
PROJECT DESIGN CRITERIA

Lower Hill Infrastructure Project

Street 3, Street 4

DESIGN ELEMENT		DESIGN CRITERIA		PROPOSED DESIGN	REFERENCE	
	Functional Classification	Town Center (Local Road/Street)		Town Center (Local Road/Street)	Design Manual 2 (Aug. 2009) Page 1-6 & 1-7	
ROADWAY	Lane Width	9' to 11'		(2) 10'-0"	Design Manual 2 (Aug. 2009) Page 1-28	
	Shoulder Width	N/A		None	Design Manual 2 (Aug. 2009) Page 1-28	
	Parking Lane*	7' to 8' (parallel)		8' (parallel)	Design Manual 2 (Aug. 2009) Page 1-28	
	Bike Lane*	N/A		None	Design Manual 2 (Aug. 2009) Page 1-28	
	Median Widths (if needed)*	N/A		None	Design Manual 2 (Aug. 2009) Page 1-28	
	Curb Return*	5' to 25'		20' and 15'	Design Manual 2 (Aug. 2009) Page 1-28	
	Travel Lanes*	2		2	Design Manual 2 (Aug. 2009) Page 1-28	
	Cross Slopes	MAX 6.0%	MIN 2.0%	MAX 6.0% MIN 2.0%	Design Manual 2 (Aug. 2009) Page 1-28 2004 AASHTO Green Book Page 148-149	
	Bridge Width	Lane widths plus shoulders each side		N/A	Design Manual 2 (Aug. 2009) Page 1-28	
	Vertical Grades (min)	0.50%		2.00%	Design Manual 2 (Aug. 2009) Page 1-28	
Vertical Clearance (min)	14'-0"		N/A	Design Manual 2 (Aug. 2009) Page 1-28		
ROADSIDE	Sidewalk Width*	10' to 13'**		6'***	Design Manual 2 (Aug. 2009) Page 1-28	
	Clear Zone Widths*	10'		2'	Design Manual 2 (Aug. 2009) Page 12-3	
	Right-of-Way Width*	Varies		64'	Design Manual 2 (Aug. 2009) Page 1-28	
SPEED	Design Speed (MPH)	MIN 20	MAX 25	25	Design Manual 2 (Aug. 2009) Page 1-28	
	Stopping Sight Distance:					
	Design Speed (MPH)	15	25	30	25	
	Min. Stopping (crest):	80'	155'	200'	140' (min)	2004 AASHTO Green Book Exhibit 3-72 (Pg. 272)
	Min. HLSD (sag):	80'	155'	200'	80' (min)	2004 AASHTO Green Book Exhibit 3-75 (Pg. 277)
	Vertical Grades	8% to 15%		7.30%	Design Manual 2 (Aug. 2009) Page 1-28	
Maximum Vertical Grades (Rolling):						
Minimum Horizontal Radius	144' (@ 25 MPH) 39' (@ 15 MPH)		20'	2004 AASHTO Green Book Exhibit 3-16 (Pg. 151)		

* Not part of the Controlling Criteria Requiring Formal Design Exception Approval

** Includes buffer and shy distance

4/9/2014

N:\Lower_Hill\deliverables\design\highways\[design_criteria_DfV.xlsx]Street 3, Street 4

Lower Hill Infrastructure Project

Street No. 1, Street No. 2, Street No. 5

DESIGN ELEMENT		DESIGN CRITERIA	PROPOSED DESIGN	REFERENCE
	Functional Classification	Community Collector (Town/Village Center)	Community Collector (Town/Village Center)	Design Manual 2 (Aug. 2009) Page 1-6 & 1-7
ROADWAY	Lane Width	10' to 11'	(2) 11'-0"	Design Manual 2 (Aug. 2009) Page 1-20
	Shoulder Width	4' (if no parking or bike lane)	None	Design Manual 2 (Aug. 2009) Page 1-20
	Parking Lane*	7' to 8' (parallel)	8' and 11' (parallel)	Design Manual 2 (Aug. 2009) Page 1-20
	Bike Lane*	5' to 6'	None	Design Manual 2 (Aug. 2009) Page 1-20
	Median Widths (if needed)*	12'-0" to 16'-0" for LT turn; 6' for peds only	None	Design Manual 2 (Aug. 2009) Page 1-20
	Curb Return*	10' to 25'	15'	Design Manual 2 (Aug. 2009) Page 1-20
	Travel Lanes*	2 to 4	2	Design Manual 2 (Aug. 2009) Page 1-20
	Cross Slopes	<u>MAX</u> <u>MIN</u> 6.0% 2.0%	<u>MAX</u> <u>MIN</u> 6.0% 2.0%	Design Manual 2 (Aug. 2009) Page 1-20 2004 AASHTO Green Book Page 148-149
	Bridge Width	Lane widths plus shoulders each side	N/A	Design Manual 2 (Aug. 2009) Page 1-20
	Vertical Grades (min)	0.50%	1.30%	Design Manual 2 (Aug. 2009) Page 1-20
	Vertical Clearance (min)	14'-0"	N/A	Design Manual 2 (Aug. 2009) Page 1-20
ROADSIDE	Sidewalk Width*	12' to 15'**	6' (min) 16' (max)**	Design Manual 2 (Aug. 2009) Page 1-20
	Clear Zone Widths*	14'	2'	Design Manual 2 (Aug. 2009) Page 12-3
	Right-of-Way Width*	Varies	Varies	Design Manual 2 (Aug. 2009) Page 1-20
SPEED	Design Speed (MPH)	<u>MIN</u> <u>MAX</u> 25 30	25	Design Manual 2 (Aug. 2009) Page 1-20
	Stopping Sight Distance:			
	<i>Design Speed (MPH)</i>	15 25 30	25	
	Min. Stopping (crest):	80' 155' 200'	114' (min)	2004 AASHTO Green Book Exhibit 3-72 (Pg. 272)
	Min. HLSD (sag):	80' 155' 200'	83' (min)	2004 AASHTO Green Book Exhibit 3-75 (Pg. 277)
	Vertical Grades			
	<i>Design Speed (MPH)</i>	20 25	25	
	Maximum Vertical Grades (Rolling):	14% 14%	13.94%	2004 AASHTO Green Book Exhibit 6-8 (Pg. 432)
Minimum Horizontal Radius	144' (@ 25 MPH) 39' (@ 15 MPH)	300' (min)	2004 AASHTO Green Book Exhibit 3-16 (Pg. 151)	

* Not part of the Controlling Criteria Requiring Formal Design Exception Approval

** Includes buffer and shy distance

4/9/2014

N:\Lower_Hill\deliverables\design\highways\[design_criteria_DfV.xlsx]Street 1, Street 2, Street 5

Lower Hill Infrastructure Project

Bedford Avenue, Crawford Street, Centre Avenue, Washington Place

DESIGN ELEMENT		DESIGN CRITERIA	PROPOSED DESIGN				REFERENCE	
	Functional Classification	Community Collector (Town/Village Center)	Community Collector (Town/Village Center)				Design Manual 2 (Aug. 2009) Page 1-6 & 1-7	
			Bedford Avenue	Crawford Street	Centre Avenue	Washington Place		
ROADWAY	Lane Width	10' to 11'	12'-0" / 11'-0"	11'-0"	10'-0"	12'-0"	Design Manual 2 (Aug. 2009) Page 1-20	
	Shoulder Width	4' (if no parking or bike lane)	None	None	None	None	Design Manual 2 (Aug. 2009) Page 1-20	
	Parking Lane*	7' to 8' (parallel)	None	11'-0"	8'-0"	None	Design Manual 2 (Aug. 2009) Page 1-20	
	Bike Lane*	5' to 6'	None	None	6' Excl. / 4' Shared	None	Design Manual 2 (Aug. 2009) Page 1-20	
	Median Widths (if needed)*	12'-0" to 16'-0" for LT turn; 6' for peds only	20'-0"	None	5'-0"	10'-0"	Design Manual 2 (Aug. 2009) Page 1-20	
	Curb Return*	10' to 25'	15'	15'	15'	15'	Design Manual 2 (Aug. 2009) Page 1-20	
	Travel Lanes*	2 to 4	2/4	2	4	6	Design Manual 2 (Aug. 2009) Page 1-20	
	Cross Slopes	<u>MAX</u> 6.0% <u>MIN</u> 2.0%	<u>MAX</u> 6.0% <u>MIN</u> 2.0%	<u>MAX</u> 6.0% <u>MIN</u> 2.0%	<u>MAX</u> 6.0% <u>MIN</u> 2.0%	<u>MAX</u> 6.0% <u>MIN</u> 2.0%	<u>MAX</u> 6.0% <u>MIN</u> 2.0%	Design Manual 2 (Aug. 2009) Page 1-20 2004 AASHTO Green Book Page 148-149
	Bridge Width	Lane widths plus shoulders each side	N/A	N/A	N/A	N/A	N/A	Design Manual 2 (Aug. 2009) Page 1-20
	Vertical Grades (min)	0.50%	1.23%	0.55%	2.15%	0.70%	Design Manual 2 (Aug. 2009) Page 1-20	
Vertical Clearance (min)	14'-0"	N/A	N/A	N/A	N/A	N/A	Design Manual 2 (Aug. 2009) Page 1-20	
ROADSIDE	Sidewalk Width*	12' to 15'**	6' (min) 10' (max)**	6'-0"	12'-0"	10'-0"	Design Manual 2 (Aug. 2009) Page 1-20	
	Clear Zone Widths*	14'	2'	2'	2'	2'	Design Manual 2 (Aug. 2009) Page 12-3	
	Right-of-Way Width*	Varies	Varies	Varies	Varies	Varies	Design Manual 2 (Aug. 2009) Page 1-20	
SPEED	Design Speed (MPH)	<u>MIN</u> 25 <u>MAX</u> 30	25	25	25	25	Design Manual 2 (Aug. 2009) Page 1-20	
	Stopping Sight Distance:							
	<u>Design Speed (MPH)</u>	15 25 30	15	15	20	15		
	Min. Stopping (crest):	80' 155' 200'	142' (min)	160' (min)	507' (min)	295' (min)	2004 AASHTO Green Book Exhibit 3-72 (Pg. 272)	
	Min. HLSD (sag):	80' 155' 200'	110' (min)	86' (min)	187' (min)	134' (min)	2004 AASHTO Green Book Exhibit 3-75 (Pg. 277)	
	Vertical Grades							
	<u>Design Speed (MPH)</u>	20 25					2004 AASHTO Green Book Exhibit 6-8 (Pg. 432)	
Maximum Vertical Grades (Rolling):	14% 14%	11.75%	10.40%	7.60%	3.50%			
Minimum Horizontal Radius	144' (@ 25 MPH) 39' (@ 15 MPH)	670'	None	305'	None	2004 AASHTO Green Book Exhibit 3-16 (Pg. 151)		

* Not part of the Controlling Criteria Requiring Formal Design Exception Approval

** Includes buffer and shy distance

4/9/2014

N:\Lower_Hill\deliverables\design\highways\design_criteria_DfV.xlsx\Bedford, Crawford, Centre, Wash

APPENDIX B
CONSTRUCTION COST ESTIMATE

Lower Hill Redevelopment Infrastructure Project - Design Field View Construction Cost Estimate

ITEM NUMBER	DESCRIPTION	UNIT	UNIT COST	PHASE 1		PHASE 2		PERIMETER		ENTIRE PROJECT	
				QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
0201-0001	CLEARING AND GRUBBING	LS		1	\$4,813	1	\$4,813	1	\$9,625	3	\$19,250
0203-0001	CLASS 1 EXCAVATION	CY	\$15.00	78,044	\$1,170,660	1172	\$17,580	59	\$885	79,275	\$1,189,125
0204-0150	CLASS 4 EXCAVATION	CY	\$14.50	6,253	\$90,669	4623	\$67,034	7395	\$107,228	18,271	\$264,930
0212-0001	GEOTEXTILE, CLASS 1	LF	\$1.00	5,120	\$5,120	3,044	\$3,044	8,160	\$8,160	16,323	\$16,323
0303-0001	CEMENT TREATED PERMEABLE BASE COURSE, 4" DEPTH	SY	\$14.00	11,927	\$166,973	6,952	\$97,326			18,879	\$264,299
0350-0104	SUBBASE 4" DEPTH (NO 2A)	SY	\$9.00	11,927	\$107,340	6,952	\$62,567			18,879	\$169,907
0409-0341	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, < 0.3 MILLION ESALS, 12.5 MM MIX, 1 1/2" DEPTH, SRL-E	SY	\$9.00					26,490	\$238,406	26,490	\$238,406
0409-6370	SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, < 0.3 MILLION ESALS, 19.0 MM MIX	TON	\$100.00					2,285	\$228,473	2,285	\$228,473
0460-0001	BITUMINOUS TACK COAT	SY	\$0.25					26,490	\$6,622	26,490	\$6,622
0491-0015	MILLING OF BITUMINOUS PAVEMENT SURFACE, 3" DEPTH, MILLED MATERIAL RETAINED BY CONTRACTOR	SY	\$3.00					26,490	\$79,469	26,490	\$79,469
0501-0200	REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	SY	\$70.00					222	\$15,510	222	\$15,510
0501-0202	REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH	SY	\$60.00	11,927	\$715,601	6,952	\$417,111			18,879	\$1,132,711
0601-XXXX	18" STORM SEWER PIPE	LF	\$85.00	1,227	\$104,295	867	\$73,695			2,094	\$177,990
0601-XXXX	24" STORM SEWER PIPE	LF	\$115.00	778	\$89,470	735	\$84,525	353	\$40,595	1,866	\$214,590
0601-XXXX	30" STORM SEWER PIPE	LF	\$130.00			294	\$38,220			294	\$38,220
0601-XXXX	36" STORM SEWER PIPE	LF	\$140.00			252	\$35,280			252	\$35,280
0605-XXXX	INLET	EA	\$3,500.00	29	\$101,500	15	\$52,500	12	\$42,000	56	\$196,000
0609-0002	INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE A	LS	\$15,000.00	1	\$15,000	1	\$15,000	1	\$15,000	3	\$45,000
0609-0009	EQUIPMENT PACKAGE	LS	\$4,500.00	1	\$4,500	1	\$4,500	1	\$4,500	3	\$13,500
0610-7002	6" PAVEMENT BASE DRAIN	LF	\$11.00	5,120	\$56,320	3,044	\$33,482	8,160	\$89,756	16,323	\$179,558
0613-0001	STONE BACKFILL FOR MISCELLANEOUS DRAINAGE	CY	\$50.00	3,009	\$150,450	2482	\$124,100	1252	\$62,600	6,743	\$337,150
9630-0001	CONCRETE DEEP CURB	LF	\$30.00	5,321	\$159,632	3,071	\$92,130	12,690	\$380,706	21,082	\$632,468
0676-0001	CEMENT CONCRETE SIDEWALK	SY	\$65.00	5,667	\$368,358	4,417	\$287,090	8,217	\$534,115	18,301	\$1,189,563
9676-0001	HEAVY DUTY CEMENT CONCRETE SIDEWALK	SY	\$75.00	1,555	\$116,615	1,172	\$87,927	735	\$55,091	3,462	\$259,633
0686-0010	CONSTRUCTION SURVEYING, TYPE A	LS		1	\$25,000	1	\$25,000	1	\$50,000	3	\$100,000
0689-0002	NETWORK SCHEDULE	LS	\$5,000.00	1	\$5,000	1	\$5,000	1	\$5,000	3	\$15,000
0695-0002	DETECTABLE WARNING SURFACES	SF	\$35.00	160	\$5,600	112	\$3,920	232	\$8,120	504	\$17,640
0703-0025	NO. 57 COARSE AGGREGATE	CY	\$100.00					31	\$3,077	31	\$3,077
0802-0001	TOPSOIL FURNISHED AND PLACED	CY	\$20.00	1,289	\$25,775	418.31	\$8,366	266.42	\$5,328	1,973	\$39,470
0804-0011	SEEDING AND SOIL SUPPLEMENTS - FORMULA B	LB	\$20.00	243.58	\$4,872	79.06	\$1,581	34.77	\$695	357.41	\$7,148
0805-0022	MULCHING -STRAW	TON	\$250.00	6.96	\$1,740	2.26	\$565	0.99	\$248	10.21	\$2,553
0845-0001	UNFORSEEN WATER POLLUTION CONTROL	DOLLA	\$1.00	1,500	\$1,500	1,500	\$1,500	2,000	\$2,000	5,000	\$5,000
4910-0001	JUNCTION BOXES J.B.-1 MODIFIED	EA	\$1,600.00	7	\$11,200	9	\$14,400	14	\$22,400	30	\$48,000
4910-0005	JUNCTION BOXES J.B.-12 MODIFIED	EA	\$1,400.00	1	\$1,400	2	\$2,800	3	\$4,200	6	\$8,400
4931-0001	POST MOUNTED SIGNS, TYPE B MODIFIED	SF	\$49.00	133	\$6,517	101	\$4,949	119	\$5,831	353	\$17,297
0935-0001	POST MOUNTED SIGNS, TYPE F	SF	\$19.00	27	\$513	29	\$551	43	\$817	99	\$1,881
0936-0200	STRUCTURE MOUNTED FLAT SHEET ALUMINUM SIGNS	SF	\$40.00	64	\$2,560	92	\$3,680	162	\$6,480	318	\$12,720
0941-0001	RESET POST MOUNTED SIGNS, TYPE B	EA	\$125.00					9	\$1,125	9	\$1,125
0945-0001	RESET POST MOUNTED SIGNS, TYPE F	EA	\$30.00					5	\$150	5	\$150

ITEM NUMBER	DESCRIPTION	UNIT	UNIT COST	PHASE 1		PHASE 2		PERIMETER		ENTIRE PROJECT	
				QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
0951-0116	TRAFFIC SIGNAL SUPPORT, 16' MAST ARM	EA	\$9,000.00	1	\$9,000					1	\$9,000
0951-0120	TRAFFIC SIGNAL SUPPORT, 20' MAST ARM	EA	\$10,000.00					1	\$10,000	1	\$10,000
0951-0124	TRAFFIC SIGNAL SUPPORT, 24' MAST ARM	EA	\$11,000.00			1	\$11,000	2	\$22,000	3	\$33,000
0951-0128	TRAFFIC SIGNAL SUPPORT, 28' MAST ARM	EA	\$13,000.00					1	\$13,000	1	\$13,000
0951-0130	TRAFFIC SIGNAL SUPPORT, 30' MAST ARM	EA	\$13,500.00	1	\$13,500					1	\$13,500
0951-0132	TRAFFIC SIGNAL SUPPORT, 32' MAST ARM	EA	\$14,000.00	1	\$14,000			1	\$14,000	2	\$28,000
0951-0134	TRAFFIC SIGNAL SUPPORT, 34' MAST ARM	EA	\$15,000.00					1	\$15,000	1	\$15,000
0951-0138	TRAFFIC SIGNAL SUPPORT, 38' MAST ARM	EA	\$18,000.00			1	\$18,000			1	\$18,000
0951-0140	TRAFFIC SIGNAL SUPPORT, 40' MAST ARM	EA	\$19,000.00			1	\$19,000	1	\$19,000	2	\$38,000
0951-0144	TRAFFIC SIGNAL SUPPORT, 44' MAST ARM	EA	\$20,000.00					1	\$20,000	1	\$20,000
0951-2132	TRAFFIC SIGNAL SUPPORT, 32' MAST ARM WITH LUMINAIRE ARM (30' MOUNTING HEIGHT)	EA	\$15,000.00	1	\$15,000					1	\$15,000
0951-2136	TRAFFIC SIGNAL SUPPORT, 36' MAST ARM WITH LUMINAIRE ARM (30' MOUNTING HEIGHT)	EA	\$18,000.00			1	\$18,000			1	\$18,000
0951-4022	PEDESTRIAN STUB POLE, TYPE B	EA	\$800.00					2	\$1,600	2	\$1,600
0954-0012	2 INCH CONDUIT	LF	\$3.50	100	\$350	102	\$357	210	\$735	412	\$1,442
0954-0013	3 INCH CONDUIT	LF	\$5.00	588	\$2,940	1028	\$5,140	1620	\$8,100	3,236	\$16,180
0954-0151	TRENCH AND BACKFILL, TYPE I	LF	\$7.50	200	\$1,500	286	\$2,145	480	\$3,600	966	\$7,245
0954-0153	TRENCH AND BACKFILL, TYPE III	LF	\$75.00	244	\$18,300	416	\$31,200	660	\$49,500	1,320	\$99,000
0954-0201	SIGNAL CABLE, 14 AWG, 3 CONDUCTOR	LF	\$1.70	1,159	\$1,970	1494	\$2,540	2640	\$4,488	5,293	\$8,998
0954-0202	SIGNAL CABLE, 14 AWG, 5 CONDUCTOR	LF	\$2.00	1,212	\$2,424	1573	\$3,146	2790	\$5,580	5,575	\$11,150
0954-0203	SIGNAL CABLE, 14 AWG, 7 CONDUCTOR	LF	\$2.30	748	\$1,720	1686	\$3,878	2430	\$5,589	4,864	\$11,187
4954-0402	ELECTRICAL SERVICE, TYPE B MODIFIED	EA	\$2,800.00	1	\$2,800	2	\$5,600	3	\$8,400	6	\$16,800
4955-3208	VEHICULAR SIGNAL HEAD, THREE 12" SECTIONS MODIFIED	EA	\$700.00	8	\$5,600	10	\$7,000	20	\$14,000	38	\$26,600
4955-3210	VEHICULAR SIGNAL HEAD, FIVE 12" SECTIONS MODIFIED	EA	\$1,230.00			6	\$7,380			6	\$7,380
0956-0770	DIGITAL WAVE RADAR DETECTION SYSTEM	EA	\$7,000.00	2	\$14,000	6	\$42,000	6	\$42,000	14	\$98,000
0960-0002	4" YELLOW HOT THERMOPLASTIC PAVEMENT MARKINGS	LF	\$1.00	3,452	\$3,452	2500	\$2,500	1995	\$1,995	7,947	\$7,947
0960-0005	6" WHITE HOT THERMOPLASTIC PAVEMENT MARKINGS	LF	\$1.50			50	\$75	4982	\$7,473	5,032	\$7,548
0960-0008	8" WHITE HOT THERMOPLASTIC PAVEMENT MARKINGS	LF	\$2.50	764	\$1,910	495	\$1,238	1774	\$4,435	3,033	\$7,583
0960-0021	24" WHITE HOT THERMOPLASTIC PAVEMENT MARKINGS	LF	\$13.00	191	\$2,483	121	\$1,573	397	\$5,161	709	\$9,217
0960-0118	WHITE HOT THERMOPLASTIC LEGEND, "BICYCLE WITH RIDER", 8'-0"x4'-0"	EA	\$250.00					6	\$1,500	6	\$1,500
0960-0222	WHITE HOT THERMOPLASTIC LEGEND, "RIGHT ARROW", 12'-0"x3'-0"	EA	\$150.00					4	\$600	4	\$600
0960-0224	WHITE HOT THERMOPLASTIC LEGEND, "LEFT ARROW", 12'-0"x3'-0"	EA	\$150.00					1	\$150	1	\$150
0960-0255	WHITE HOT THERMOPLASTIC LEGEND, "YIELD LINE", 12"x18" TRIANGLE, (MIN 6 TRIANGLES PER LINE)	LF	\$25.00					18	\$450	18	\$450
0971-0001	REMOVE POST MOUNTED SIGNS, TYPE B	EA	\$40.00			4	\$160	12	\$480	16	\$640
0975-0001	REMOVE POST MOUNTED SIGNS, TYPE F	EA	\$20.00					32	\$640	32	\$640
9000-XXXX	LIGHT POLE	EA	\$5,300.00	134	\$710,200	86	\$455,800	170	\$901,000	390	\$2,067,000
9000-XXXX	TREE BOX	EA	\$15,000.00	119	\$1,785,000	81	\$1,215,000	174	\$2,610,000	374	\$5,610,000
9000-XXXX	MEDIAN BARRIER	LF	\$60.00					638	\$38,280	638	\$38,280
9000-XXXX	RELOCATION OF 12" WATERLINE ON CRAWFORD STREET	LS	\$250,000.00					1	\$250,000	1	\$250,000
9000-XXXX	REPLACE CANTILEVER AND ITS COMPONENTS	LS	\$100,000.00					1	\$100,000	1	\$100,000

ITEM NUMBER	DESCRIPTION	UNIT	UNIT COST	PHASE 1		PHASE 2		PERIMETER		ENTIRE PROJECT	
				QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
9000-0100	SANITARY SEWER, 8" PVC SDR 26, 0'-12' DEEP	LF	\$145.00	4,188	\$607,260	3229	\$468,205	1742	\$252,590	9,159	\$1,328,055
9000-0101	SANITARY SEWER MANHOLE, 4' DIAMETER, 0'-8' DEPTH	EA	\$5,750.00	10	\$57,500	7	\$40,250	13	\$74,750	30	\$172,500
9000-0102	SANITARY SEWER MANHOLE, 4' DIAMETER, OVER EXISTING SEWER	EA	\$8,000.00	2	\$16,000	1	\$8,000			3	\$24,000
9000-0103	SANITARY SEWER MANHOLE, 4' DIAMETER, ADDITIONAL DEPTH	VF	\$350.00	42	\$14,700	34	\$11,900	8	\$2,800	84	\$29,400
9000-0202	DUCTILE IRON WATERLINE, 12" CLASS 52	LF	\$125.00	2,696	\$337,000	1681	\$210,125	2798	\$349,750	7,175	\$896,875
9000-0203	DUCTILE IRON FITTINGS	LBS	\$5.75	4,525	\$26,019	3225	\$18,544			7,750	\$44,563
9000-0205	GATE VALVE W/ MEG BOX, 12"	EA	\$2,750.00	12	\$33,000	11	\$30,250			23	\$63,250
9000-0206	PWSA FIRE HYDRANT ASSEMBLY	EA	\$3,900.00	7	\$27,300	5	\$19,500			12	\$46,800
9000-0207	CONCRETE THRUST BLOCKING OR ANCHOR	CY	\$275.00	14	\$3,850	11	\$3,025			25	\$6,875
9000-0208	CONNECTION TO EXISTING WATERLINE	EA	\$3,500.00	5	\$17,500	3	\$10,500			8	\$28,000
9951-4014	TRAFFIC SIGNAL SUPPORT, 15' STRAIN POLE TYPE X	EA	\$3,750.00	3	\$11,250	5	\$18,750	8	\$30,000	16	\$60,000
9951-4030	TRAFFIC SIGNAL SUPPORT, 30' STRAIN POLE TYPE X-L WITH LUMINAIRE ARM (30' MOUNTING HEIGHT)	EA	\$6,500.00	1	\$6,500					1	\$6,500
9951-4434	TRAFFIC SIGNAL SUPPORT, 44' MAST ARM AND 34' MAST ARM	EA	\$28,000.00			1	\$28,000			1	\$28,000
9954-0210	INTERCONNECT CABLE, FIBER OPTIC, TRENCH, AND CONDUIT	LF	\$15.00					4000	\$60,000	4,000	\$60,000
9952-1050	TYPE 170E CONTROLLER ASSEMBLY, TYPE 1 MOUNTING WITH PROM MODULE	EA	\$14,000.00	1	\$14,000	2	\$28,000	3	\$42,000	6	\$84,000
9955-3721	PEDESTRIAN SIGNAL HEAD, TYPE B, WITH COUNTDOWN TIMER AND INCANDESCENT LOOK	EA	\$600.00	8	\$4,800	12	\$7,200	16	\$9,600	36	\$21,600
9956-0500	PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL	EA	\$1,232.00	8	\$9,856	12	\$14,784	16	\$19,712	36	\$44,352
9960-0118	WHITE HOT THERMOPLASTIC LEGEND, "SHARED LANE MARKING"	EA	\$250.00					8	\$2,000	8	\$2,000
9960-0220	WHITE HOT THERMOPLASTIC LEGEND, "BICYCLE LANE ARROW"	EA	\$250.00					6	\$1,500	6	\$1,500

			SUBTOTAL		\$7,311,676		\$4,439,998		\$7,057,671		\$18,809,345
	MAINTENANCE AND PROTECTION OF TRAFFIC	5%	+		\$365,584	+	\$222,000	+	\$352,884	+	\$940,467
			SUBTOTAL		\$7,677,260		\$4,661,998		\$7,410,555		\$19,749,812
	MOBILIZATION	4%	+		\$307,090.39	+	\$186,479.91	+	\$296,422.20	+	\$789,992.50
			SUBTOTAL		\$7,984,350		\$4,848,478		\$7,706,977		\$20,539,805
	CONTINGENCY	30%	+		\$2,395,305	+	\$1,454,543	+	\$2,312,093	+	\$6,161,941
			TOTAL		\$10,379,655		\$6,303,021		\$10,019,070		\$26,701,746