



**JOINT WORK SESSION MEETING
AGENDA
CITY OF CREVE COEUR
CITY COUNCIL AND PARK AND HISTORIC PRESERVATION COMMITTEE
300 NORTH NEW BALLAS RD
AUGUST 12, 2019
6:00 PM**

CALL TO ORDER

ROLL CALL

DISCUSSION ITEMS

1. Parks Master Plan Final Review

Summary: Planning Design Studio (PDS) has provided an updated the draft of the Master Plan based on additional comments and input from the public, the Parks and Historic Preservation Committee (PHP) and City Council. Scott Emmelkamp of PDS will present the revised plan for further discussion with the City Council and PHP.

2. Millennium Park Trail Review

Summary: The City hired the engineering firm Intuition & Logic to review several trail connections within and around Millennium Park. Staff will present the report and discuss its findings.

Pursuant to Section 610.022 RSMo., the City Council could, at any time during the meeting, vote to close the public meeting and move to closed session to discuss matters relating to litigation, legal actions and/or communications from the City Attorney as provided under Section 610.021(1) RSMo. and/or personnel matters under Section 610.021(13) RSMo. And/or employee matters under Section 610.021(3) RSMo. and/or real estate matters under Section 610.021(2) or other matters as permitted by Chapter 610.

Posted: _____ posted 08/8/2019

Deborah Ryan, MPCC
City Clerk



City Council
300 North New Ballas Rd
Creve-Coeur, MO 63141

Debbie Ryan
City Clerk
(314) 872-2517
www.creve-coeur.org/

Meeting: 08/12/19 06:00 PM

DOC ID: 3498

DISCUSSION ITEM (ID # 3498)

Parks Master Plan Final Review



City Council
300 North New Ballas Rd
Creve-Coeur, MO 63141

Meeting: 08/12/19 06:00 PM
Department: Public Works Department
Category: Discussion
Prepared By: Matt Wohlberg
Department Head: Jim Heines

SCHEDULED

STAFF REPORT

Millennium Park Trail Review

The City hired the engineering firm Intuition & Logic to review several trail connections within and around Millennium Park. Staff will present the report and discuss its findings.

Prepared exclusively for:



Millennium Park Trails Concept Analysis

July 2019

INTUITION & N
LOGIC

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16253 Swingley Ridge Rd, Suite 100, St. Louis, MO 63017
636.777.3000  314.432.5812



July 12, 2019

Matt Wohlberg, PE, CFM
City Engineer
Creve Coeur, MO 63141

RE: Millennium Park Trail Expansion Study

Dear Mr. Wohlberg,

Intuition & Logic Engineering, Inc. is pleased to present the Millennium Park Trail Expansion Study analysis to the City of Creve Coeur, Missouri.

I have reviewed the contents of this document in its entirety for quality control and compliance with contractual obligations and approve this submittal. If you have any questions or would like additional information, please call me at (636) 777-3000 at your convenience to discuss.

I look forward to hearing from you soon.

Best regards,

A handwritten signature in black ink, appearing to read "Mark E. Meyer".

Mark E. Meyer, PE, CFM
President

It is by LOGIC that we prove
but by INTUITION that we discover

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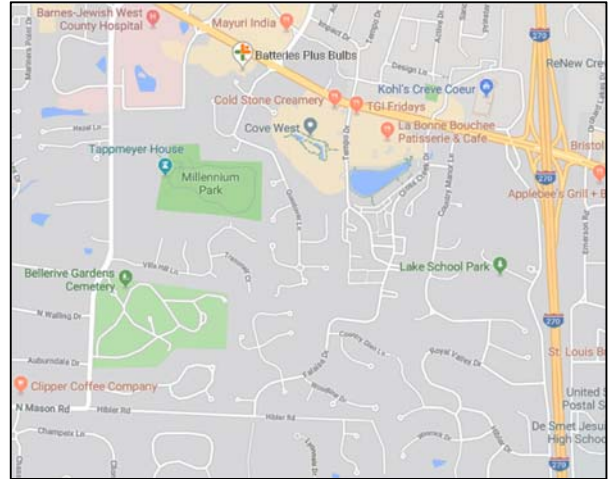
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1.0 Introduction

The City of Creve Coeur (City), Missouri is in the process of developing trail expansion and connection options for Millennium Park. The trail expansion is intended to be a low impact nature trail with a wood mulch or crushed gravel surface. The connection spurs are intended to expand the park's connectivity to the surrounding neighborhoods. The park is generally located south of the intersection of Olive Boulevard and N Mason Rd.

The City retained Intuition & Logic Engineering, Inc. (I&L) to develop trail expansion and spur connections. The intent of this report is to prepare potential alignments; review permitting and utility concerns for each alignment; and develop an order of magnitude engineering and construction cost opinion for the City's use in evaluating the options and budgeting for the trail expansion.

The Study Area is illustrated in **Exhibit 1 – Location Map**.



2.0 Approach

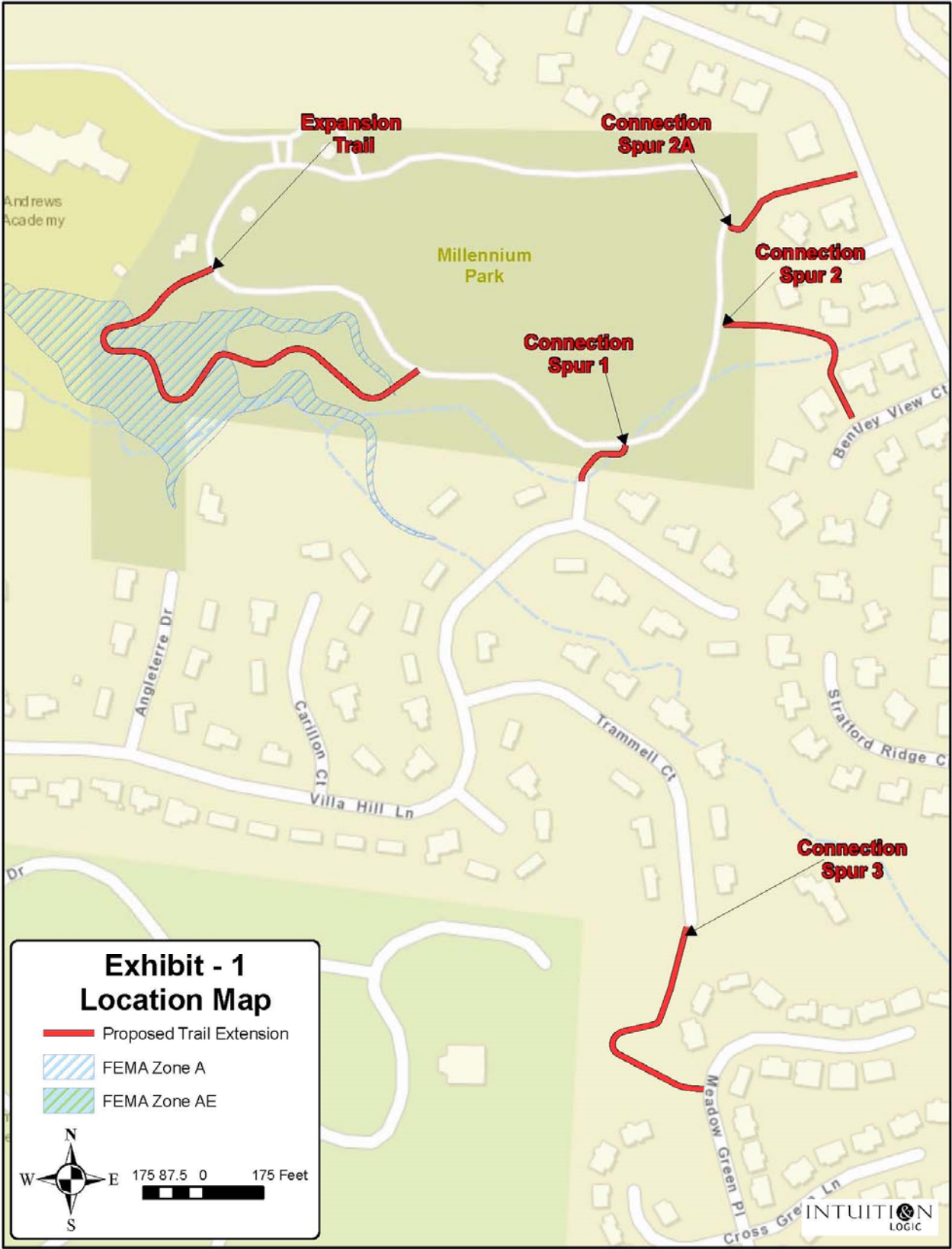
I&L conducted a field reconnaissance with City personnel on July 2, 2019 to review several bridge crossing locations, potential trail alignment options and spur segment locations for feasibility. A follow up review of the identified alignments and spurs was conducted in the office using readily available GIS information which included 1 foot contours, aerials, storm and sanitary sewer alignments, and parcel data.

3.0 Results

Schematic trails alignments were developed based on the field work and subsequent analysis. 4 trail alignments were developed as follows:

Proposed Project	Estimated Cost
1 – Expansion Trail	\$390,200
2 – Connection Spur 1: Connects Villa Hill Lane to Millennium Park	\$168,600
3 – Connection Spur 2: Connects Bentley View Court to Millennium Park	\$152,200
4 – Connection Spur 2A: Connects Questover Lane to Millennium Park	\$157,800
5 – Connection Spur 3: Connects Meadow Green Place to Trammell Court which provides access to Millennium Park from subdivisions south and east of the park.	\$212,000

The trail alignments are illustrated in **Exhibit 1 – Location Map**.



a. Millennium Park Expansion Trail

Project Description: The proposed trail expansion starts near the Tappmeyer House located to the southwest side of the park and winds through the wooded area south of the existing trail. Fernridge Creek and an unnamed tributary run east–west through the wooded area and the proposed trail crosses the tributary at two locations requiring two bridge crossings. Potential impacts to the existing wooded area can be minimized by generally following some of the existing foot trails through the wooded area. The proposed expansion trail alignment is illustrated in **Exhibit 2 – Expansion Trail Alignment**.

The proposed expansion trail is approximately 1250 ft long, will typically be at grade and will generally meet ADA slope requirements of 5% or less. Proposed bridge 1 is approximately 40 feet long and proposed bridge 2 is approximately 55 feet long. Each bridge location will have a rock grade control to protect the abutments from channel erosion and scour. The trail surface can be wood mulch or crushed gravel. A 14 ft wide trail section is anticipated to match the existing trail width.

Utility Considerations: This option is expected to have zero to minimal impacts on existing utilities. An existing sanitary sewer trunk main runs through the wooded corridor, but the trail is not expected to have any conflicts with the existing sewer.

Geotechnical Considerations: Geotechnical exploration is recommended to develop design requirements for each bridge abutment. Two borings are anticipated at each bridge.

Environmental Impacts and Permitting Considerations: Please refer to the general Environmental Impacts and Permitting Considerations section at the end of this report.

Other Recommendations: Fernridge creek and the unnamed tributary are showing signs of widening and plan form adjustment. As a result, I&L recommends using a 30 feet buffer from the channel top of banks to prevent trail undermining by future channel migration. Historical obstacle course elements located in the wooded area should be removed during the trail construction.

Estimated Project Cost: \$390,200



Figure ES-1: Expansion Start Point



Figure ES-2: Proposed Bridge 1



Figure ES-3: Existing foot trail



Figure ES-4: Proposed Bridge 2



b. Millennium Park – Connection Spur 1

Project description: Connection Spur 1 will connect Villa Hill Lane to the southernmost extent of the existing Millennium Park trail via a 50 foot long bridge crossing over the unnamed tributary to Fernridge Creek. The proposed connection spur alignment is illustrated in **Exhibit 3 – Connection Spur 1**.

The total length of the spur is 180 ft. The elevation difference between the existing trail and Villa Hill Lane is 5 ft. The proposed spur can meet ADA slope requirements of 5% or less by constructing a 100 ft long spur connection from the northern bridge landing. From the south bridge landing a 30 ft long trail segment at grade will connect the bridge to Villa Hill Lane. The bridge location will have a rock grade control to protect the abutments from channel erosion and scour. A 14 ft wide asphalt trail section is anticipated to match the existing trail width.

Utility Considerations: This option is expected to have zero to minimal impacts on existing utilities.

Geotechnical Considerations: Geotechnical exploration is recommended to develop design requirements for each bridge abutment. Two borings are anticipated at each bridge.

Environmental Impacts and Permitting Considerations: Please refer to the general Environmental Impacts and Permitting Considerations section at the end of this report. The connection spur is located in the draft effective floodplain.

Estimated Project Cost: \$168,600



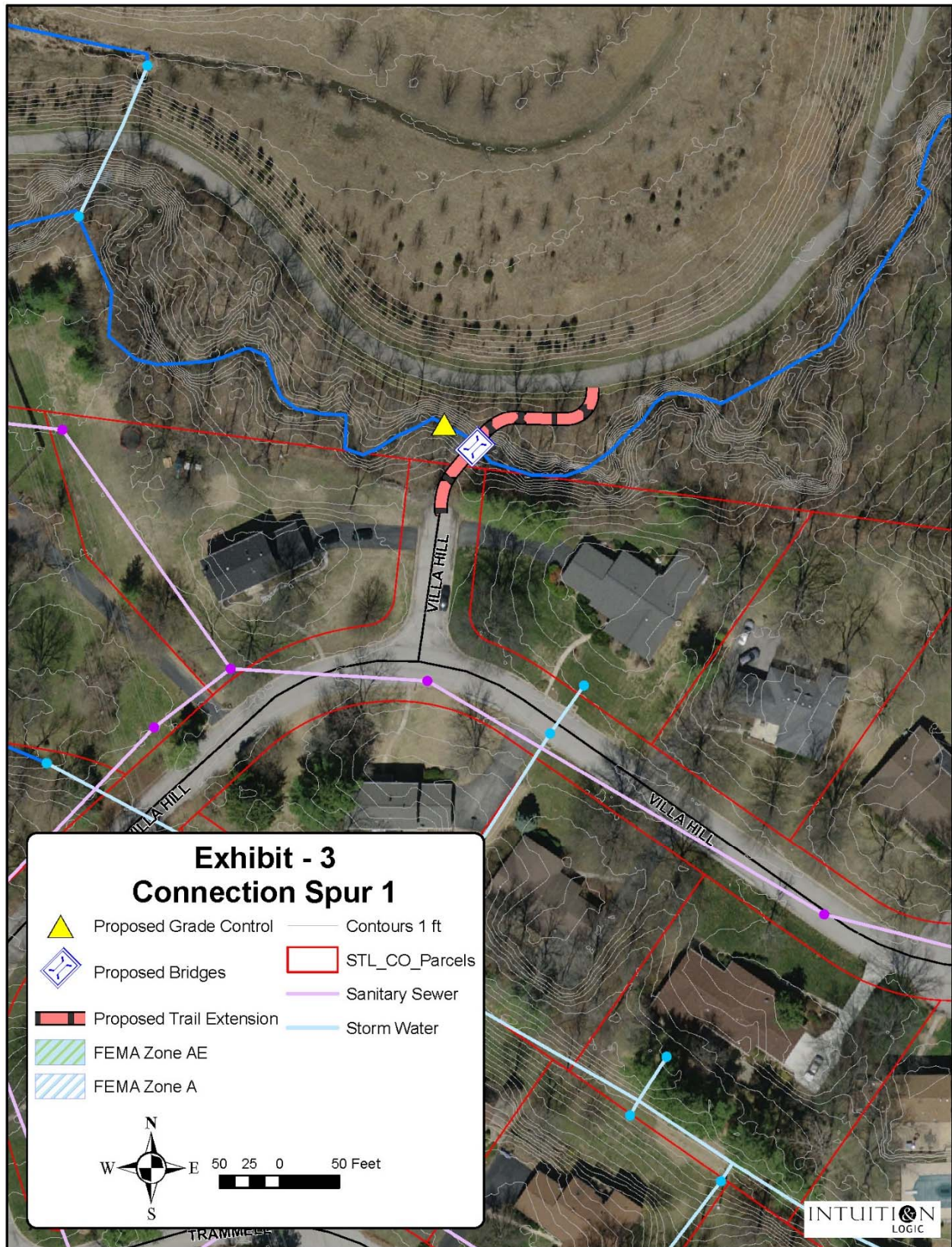
Figure ES-5: Connection Spur1



Figure ES-6: Bridge Upstream



Figure ES-7: Bridge Downstream



c. Millennium Park – Connection Spur 2

Project description: Connection Spur 2 will connect Bentley View Court to the eastern loop of the existing Millennium Park trail. The connection spur is located in the common ground access and along the embankment of a subdivision detention pond. The proposed connection spur alignment is illustrated in **Exhibit 4 – Connection Spur 2**.

The total length of the spur is 440 ft. The elevation difference between the existing trail and the top of the detention basin embankment is 5 ft. The proposed spur can meet ADA slope requirements of 5% or less by constructing a 120 ft long segment from the park to the western edge of the detention pond. A 14 ft wide asphalt trail section is anticipated to match the existing trail width.

Placing the trail along the top of the detention basin embankment will require easements from the adjoining property owners and the subdivision Home Owners Association. Three property owners will be affected in addition to the common ground. A 4 ft tall retaining wall is recommended along the northern edge of the detention basin to replace the sloping embankment and minimize the easement needs on the adjoining properties.

Utility Considerations: This option is expected to have zero to minimal impacts on existing utilities.

Geotechnical Considerations: Geotechnical exploration is recommended to develop design requirements for the retaining wall. Two borings are anticipated along the wall.

Environmental Impacts and Permitting Considerations: Please refer to the general Environmental Impacts and Permitting Considerations section at the end of this report. The connection spur is located in the draft effective floodplain. Modification of the existing detention pond will require a new detention basin study to verify the peak outflow rates and storage are not being diminished.

Estimated Project Cost: \$152,200



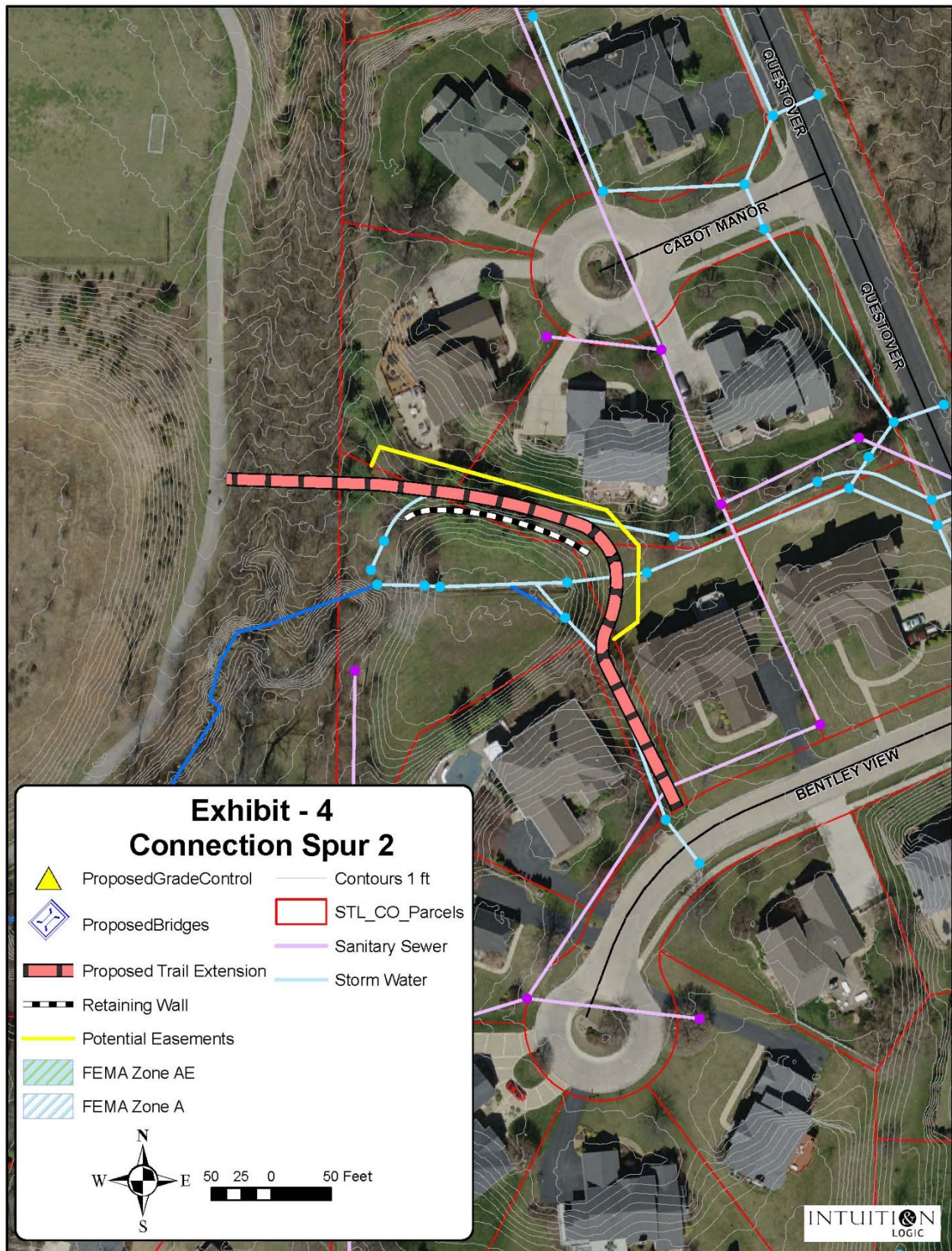
Figure ES-8: Spur 2 Entry Point



Figure ES-9: Detention Pond



Figure ES-10: Existing foot trail



d. Millennium Park – Connection Spur 2A

Project description: Connection Spur 2A is an alternative to Connection Spur 2. The spur will connect Questover Lane to the eastern loop of the existing Millennium Park trail. The connection spur is located approximately 500 feet north of Connection Spur 2. The proposed connection spur alignment is illustrated in **Exhibit 5 – Connection Spur 2A**.

The total length of the spur is 340 ft. The existing grade supports the proposed spur to meet ADA slope requirements of 5% or less through the entirety of the trail. A 14 ft wide asphalt trail section is anticipated to match the existing trail width.

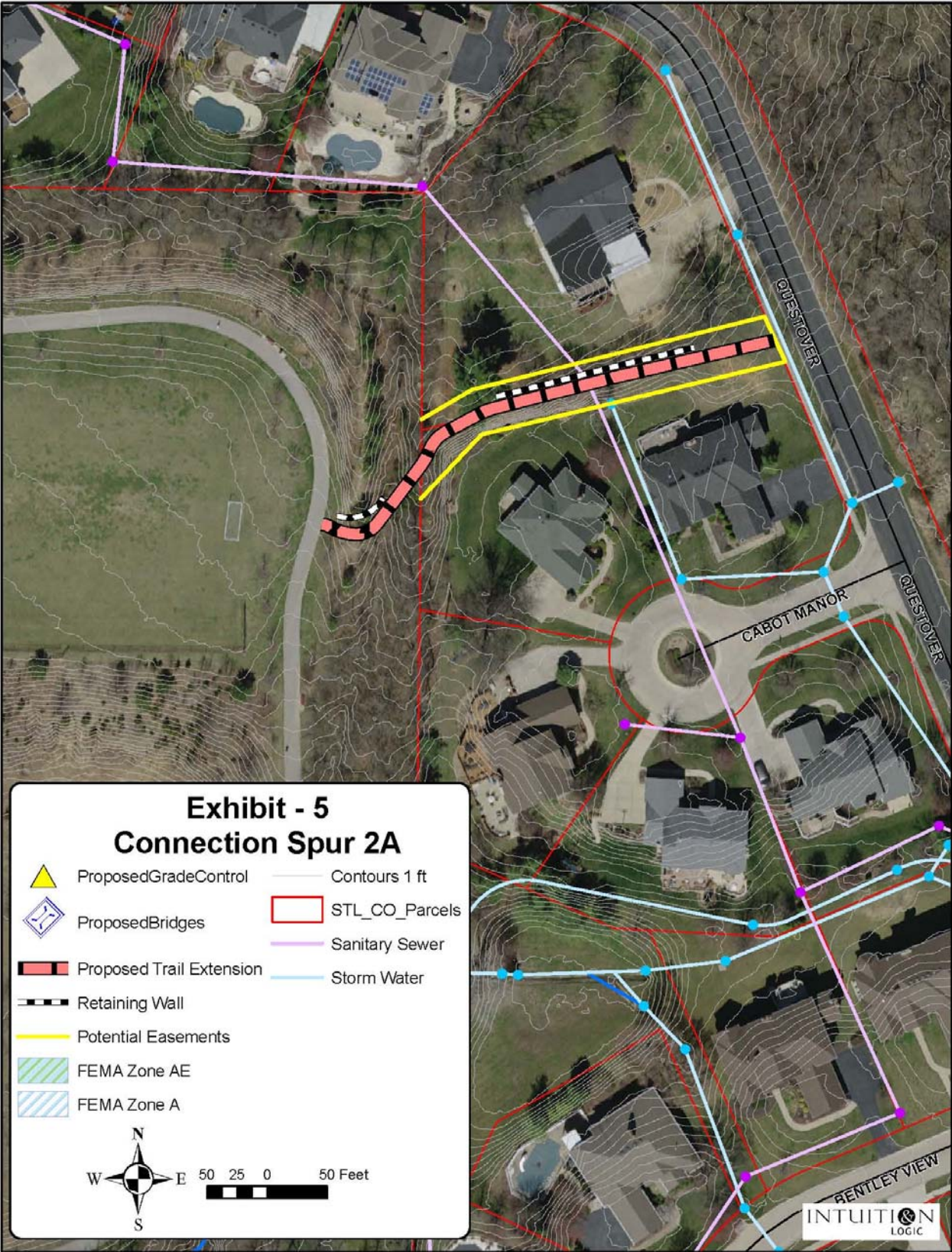
Three property owners will be affected in the proposed alignment. Two retaining walls are recommended along the trail; a 4 ft tall wall near the mid-section and a 3 ft tall wall near the connection to the park trail. The wall near the existing trail could be tied into the existing retaining wall.

Utility Considerations: This option is expected to have zero to minimal impacts on existing utilities.

Geotechnical Considerations: Geotechnical exploration is recommended to develop design requirements for the retaining wall. Three borings are anticipated to support the retaining wall design.

Environmental Impacts and Permitting Considerations: Please refer to the general Environmental Impacts and Permitting Considerations section at the end of this report. The connection spur is not located in the draft effective floodplain.

Estimated Project Cost: \$157,800



e. Millennium Park Trail Expansion – Connection Spur 3

Project description: Connection Spur 3 will connect Meadow Green Place to Trammell Court and ultimately to the Millennium Park trail via Connection Spur 1. The connection spur is located in common ground area and within an electric distribution line corridor. The proposed connection spur alignment is illustrated in **Exhibit 6 – Connection Spur 3**.

The trail has some challenging steep slopes in the mid portion to be addressed to be in accordance with ADA recommended slopes. The initial and the ending segments of the trail lay on relatively flat ground.

The total length of the spur is 600 ft. The elevation difference along the trail is 27 ft. The proposed spur can meet ADA slope requirements of 5% or less by constructing a 400 ft long switchback connection starting at the rear property line of 531 Meadow Green Place and looping westward through the wooded area. A 6 ft tall retaining wall is anticipated along a portion of this route to facilitate the grade change. Alternatively, the trail could be configured to have a series of switchbacks and stay within the open space of the utility corridor. A 14 ft wide asphalt trail section is anticipated to match the existing trail width.

This alignment will require an easement from the subdivision Home Owners Association.

Utility Considerations: This option is expected to have zero to minimal impacts on existing utilities. This option will require coordination with Ameren regarding minimum clearance height requirements below the power line. The amount of fill placed to elevate the trail may be limited by the minimum clearance height requirement.

Geotechnical Considerations: Geotechnical exploration is recommended to develop design requirements for the retaining wall. Three borings are anticipated along the wall.

Environmental Impacts and Permitting Considerations: Please refer to the general Environmental Impacts and Permitting Considerations section at the end of this report.

Estimated Project Cost: \$212,000



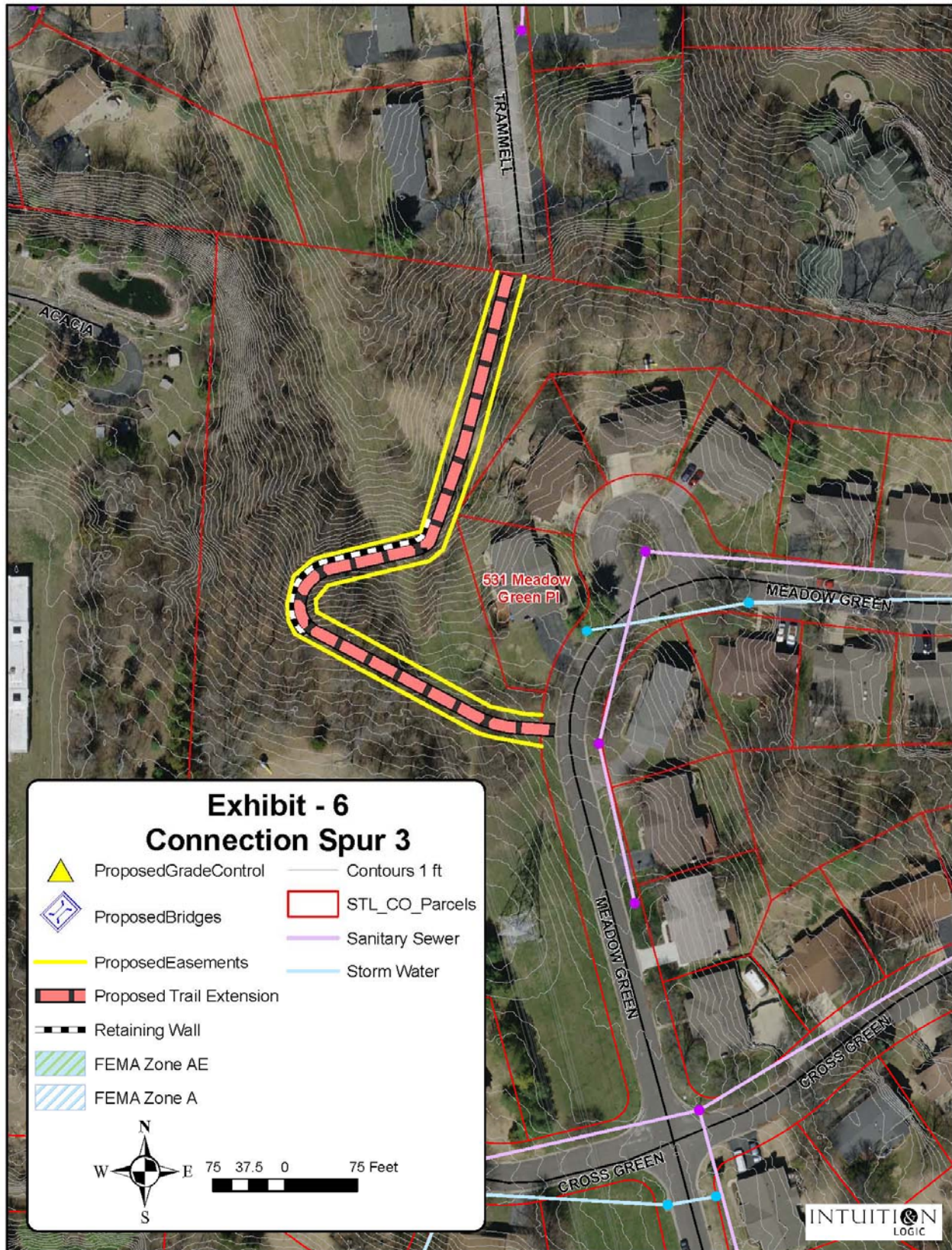
Figure ES-11: Utility corridor looking north



Figure ES-12: Steep Slope in corridor looking south



Figure ES-13: Tie-in at Trammell Court



4.0 Environmental Impacts and Permitting

The proposed trail park expansion and neighborhood spur connections will affect the following existing natural resources in the project area. A list of the impacts and required permitting is listed below.

Impact to Special Areas and Water Quality: There are no wetlands identified near the project area. However, the project area is home to the following animals that are identified as threatened and endangered species by the Missouri Department of Conservation:

- Aquatic invertebrates - Ebony Shell, Elephantear, Pink Mucket, Scaleshell, Sheepnose, and Snuffbox.
- Mammals - Eastern spotted skunk, Gray Myotis (gray bat), Indiana Myotis (Indiana bat).
- Birds - Northern Harrier which is a migratory bird, and Peregrine Falcon.
- Fishes - Pallid Sturgeon, Flathead Chub, and Lake Sturgeon.

The project will require tree removal restrictions for breeding, roosting and migration times of year.

Permitting: The expansion trail and spur connections generally disturb less than 1 acre if they are developed individually. If they are done concurrently, the total disturbance may exceed one acre. A list of permits required for construction are provided in the table below.

Agency	Permit required
City of Creve Coeur, MO	Site improvement permit, and Floodplain development permit
MSD	Plan review, Flood Study review Water Quality BMPs may be required to offset the increased imperviousness added by the trails.
MO DNR	401 permit for State CWA Land Disturbance Permit (if over 1 ac)
USACE	404 permit for CWA

Appendix

Cost Worksheets

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Millennium Park Trail Expansion - Cost Opinion Worksheet

Project ID: 1914

Project Description: Proposed Millennium Park Trail Expansion

INTUITION
LOGIC

SURVEYING

Description	Unit	Quantity	Unit Cost	Sub Total
Boundary and Topo Surveying	ACRE	1.55	\$ 5,000	\$ 7,700
Prepare Easement Plat and Scripts; Title Report	EACH	0	\$ 1,000	\$ -
Construction Staking and As-Built Surveying	ACRE	1.55	\$ 2,500	\$ 3,900
			Subtotal =	\$ 11,600
			Contingency = 15%	\$ 1,700
			TOTAL OPINION OF SURVEYING COST =	\$ 13,300

GEOTECHNICAL

Description	Unit	Quantity	Unit Cost	Sub Total
Field Borings	LF	80	\$ 20	\$ 1,600
Geotechnical Report	LUMP	1	\$ 2,500	\$ 2,500
Global Stability Analysis	EACH	2	\$ 100	\$ 200
			Subtotal =	\$ 4,300
			Contingency = 15%	\$ 600
			TOTAL OPINION OF GEOTECHNICAL COST =	\$ 4,900

ENGINEERING DESIGN AND CONSTRUCTION DOCUMENTS

Description	Unit	Quantity	Unit Cost	Sub Total
Preliminary Design	HOURS	120	\$ 100	\$ 12,000
ROW	HOURS	0	\$ 100	\$ -
Permitting	HOURS	60	\$ 100	\$ 6,000
Final Design	HOURS	100	\$ 100	\$ 10,000
Develop Plans and Construction Documents	HOURS	150	\$ 75	\$ 11,300
Construction Support	HOURS	120	\$ 100	\$ 12,000
			\$ -	\$ -
			Subtotal =	\$ 51,300
			Contingency = 15%	\$ 7,700
			TOTAL OPINION OF ENGINEERING AND CONSTRUCTION OBSERVATION COST =	\$ 59,000

CONSTRUCTION

Description	Unit	Quantity	Unit Cost	Sub Total
Removal of Existing Structures or Trees	EACH	6	\$ 2,000	\$ 12,000
Excavation and Embankment in Place	CY	2,200	\$ 15	\$ 33,000
Trail Surface (asphalt) 4" thick	SY	0	\$ 40	\$ -
Trail Surface (crushed rock) 4" thick	SY	1,950	\$ 10	\$ 19,500
Trail aggregate base 4" thick	SY	1,950	\$ 10	\$ 19,500
Rock Grade Control	CY	810	\$ 75	\$ 60,800
Grade Control Sheet Pile	SF	0	\$ 25	\$ -
Rock Stilling Basin / Outlet Scour Protection	CY	0	\$ 75	\$ -
Rock Toe and Slope Protection	CY	0	\$ 75	\$ -
Riparian Corridor Planting	SF	0	\$ 0.50	\$ -
Site Restoration	ACRE	0.57	\$ 15,000	\$ 8,600
New Culvert	LF	0	\$ 500.0	\$ -
Retaining Wall	SF	0	\$ 50	\$ -
Wetland Planting	ACRE	0.00	\$ 40,000	\$ -
Spillway Repair	SF	0	\$ 15	\$ -
Pedestrian Bridge 14 ft wide, ambulance rated	LF	95	\$ 1,000	\$ 95,000
			\$ -	\$ -
Mobilization and Bond	5%	1	\$ 12,420	\$ 12,400
			Subtotal =	\$ 260,800
			Contingency = 20%	\$ 52,200
			TOTAL OPINION OF CONSTRUCTION COST =	\$ 313,000

TOTAL SURVEYING, GEOTECHNICAL, ENGINEERING AND CONSTRUCTION COST OPINION =	\$ 390,200
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Millennium Park Trail Expansion - Cost Opinion Worksheet

Project ID: 1914

Project Description: Proposed Millennium Park Connection Spur 1

INTUITION
LOGIC

SURVEYING

Description	Unit	Quantity	Unit Cost	Sub Total
Boundary and Topo Surveying	ACRE	0.23	\$ 5,000	\$ 1,200
Prepare Easement Plat and Scripts; Title Report	EACH	0	\$ 1,000	\$ -
Construction Staking and As-Built Surveying	ACRE	0.23	\$ 2,500	\$ 600
			Subtotal =	\$ 1,800
			Contingency = 15%	\$ 300
			TOTAL OPINION OF SURVEYING COST =	\$ 2,100

GEOTECHNICAL

Description	Unit	Quantity	Unit Cost	Sub Total
Field Borings	LF	40	\$ 20	\$ 800
Geotechnical Report	LUMP	1	\$ 2,500	\$ 2,500
Global Stability Analysis	EACH	1	\$ 100	\$ 100
			Subtotal =	\$ 3,400
			Contingency = 15%	\$ 500
			TOTAL OPINION OF GEOTECHNICAL COST =	\$ 3,900

ENGINEERING DESIGN AND CONSTRUCTION DOCUMENTS

Description	Unit	Quantity	Unit Cost	Sub Total
Preliminary Design	HOURS	100	\$ 100	\$ 10,000
ROW	HOURS	0	\$ 100	\$ -
Permitting	HOURS	40	\$ 100	\$ 4,000
Final Design	HOURS	60	\$ 100	\$ 6,000
Develop Plans and Construction Documents	HOURS	100	\$ 75	\$ 7,500
Construction Support	HOURS	60	\$ 100	\$ 6,000
			\$ -	\$ -
			Subtotal =	\$ 33,500
			Contingency = 15%	\$ 5,000
			TOTAL OPINION OF ENGINEERING AND CONSTRUCTION OBSERVATION COST =	\$ 38,500

CONSTRUCTION

Description	Unit	Quantity	Unit Cost	Sub Total
Removal of Existing Structures or Trees	EACH	2	\$ 2,000	\$ 4,000
Excavation and Embankment in Place	CY	493	\$ 15	\$ 7,400
Trail Surface (asphalt) 4" thick	SY	202	\$ 40	\$ 8,100
Trail Surface (crushed rock) 4" thick	SY	0	\$ 10	\$ -
Trail aggregate base 4" thick	SY	202	\$ 10	\$ 2,000
Rock Grade Control	CY	348	\$ 75	\$ 26,100
Grade Control Sheet Pile	SF	0	\$ 25	\$ -
Rock Stilling Basin / Outlet Scour Protection	CY	0	\$ 75	\$ -
Rock Toe and Slope Protection	CY	0	\$ 75	\$ -
Riparian Corridor Planting	SF	0	\$ 0.50	\$ -
Site Restoration	ACRE	0.06	\$ 15,000	\$ 900
New Culvert	LF	0	\$ 500.0	\$ -
Retaining Wall	SF	0	\$ 50	\$ -
Wetland Planting	ACRE	0.00	\$ 40,000	\$ -
Spillway Repair	SF	0	\$ 15	\$ -
Pedestrian Bridge 14 ft wide, ambulance rated	LF	50	\$ 1,000	\$ 50,000
			\$ -	\$ -
Mobilization and Bond	5%	1	\$ 4,925	\$ 4,900
			Subtotal =	\$ 103,400
			Contingency = 20%	\$ 20,700
			TOTAL OPINION OF CONSTRUCTION COST =	\$ 124,100

TOTAL SURVEYING, GEOTECHNICAL, ENGINEERING AND CONSTRUCTION COST OPINION =	\$ 168,600
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Millennium Park Trail Expansion - Cost Opinion Worksheet

Project ID: 1914

Project Description: Proposed Millennium Park Connection Spur 2

INTUITION
LOGIC

SURVEYING

Description	Unit	Quantity	Unit Cost	Sub Total
Boundary and Topo Surveying	ACRE	0.60	\$ 5,000	\$ 3,000
Prepare Easement Plat and Scripts; Title Report	EACH	4	\$ 1,000	\$ 4,000
Construction Staking and As-Built Surveying	ACRE	0.60	\$ 2,500	\$ 1,500
			Subtotal =	\$ 8,500
			Contingency = 15%	\$ 1,300
			TOTAL OPINION OF SURVEYING COST =	\$ 9,800

GEOTECHNICAL

Description	Unit	Quantity	Unit Cost	Sub Total
Field Borings	LF	40	\$ 20	\$ 800
Geotechnical Report	LUMP	1	\$ 2,500	\$ 2,500
Global Stability Analysis	EACH	1	\$ 100	\$ 100
			Subtotal =	\$ 3,400
			Contingency = 15%	\$ 500
			TOTAL OPINION OF GEOTECHNICAL COST =	\$ 3,900

ENGINEERING DESIGN AND CONSTRUCTION DOCUMENTS

Description	Unit	Quantity	Unit Cost	Sub Total
Preliminary Design	HOURS	100	\$ 100	\$ 10,000
ROW	HOURS	40	\$ 100	\$ 4,000
Permitting	HOURS	40	\$ 100	\$ 4,000
Final Design	HOURS	60	\$ 100	\$ 6,000
Develop Plans and Construction Documents	HOURS	100	\$ 75	\$ 7,500
Construction Support	HOURS	60	\$ 100	\$ 6,000
			\$ -	\$ -
			Subtotal =	\$ 37,500
			Contingency = 15%	\$ 5,600
			TOTAL OPINION OF ENGINEERING AND CONSTRUCTION OBSERVATION COST =	\$ 43,100

CONSTRUCTION

Description	Unit	Quantity	Unit Cost	Sub Total
Removal of Existing Structures or Trees	EACH	3	\$ 2,000	\$ 6,000
Excavation and Embankment in Place	CY	489	\$ 15	\$ 7,300
Trail Surface (asphalt) 4" thick	SY	684	\$ 40	\$ 27,400
Trail Surface (crushed rock) 4" thick	SY	0	\$ 10	\$ -
Trail aggregate base 4" thick	SY	684	\$ 10	\$ 6,800
Rock Grade Control	CY	0	\$ 75	\$ -
Grade Control Sheet Pile	SF	0	\$ 25	\$ -
Rock Stilling Basin / Outlet Scour Protection	CY	0	\$ 75	\$ -
Rock Toe and Slope Protection	CY	0	\$ 75	\$ -
Riparian Corridor Planting	SF	0	\$ 0.50	\$ -
Site Restoration	ACRE	0.20	\$ 15,000	\$ 3,000
New Culvert	LF	0	\$ 500.0	\$ -
Retaining Wall	SF	504	\$ 50	\$ 25,200
Wetland Planting	ACRE	0.00	\$ 40,000	\$ -
Spillway Repair	SF	0	\$ 15	\$ -
Pedestrian Bridge 14 ft wide, ambulance rated	LF	0	\$ 1,000	\$ -
			\$ -	\$ -
Mobilization and Bond	5%	1	\$ 3,785	\$ 3,800
			Subtotal =	\$ 79,500
			Contingency = 20%	\$ 15,900
			TOTAL OPINION OF CONSTRUCTION COST =	\$ 95,400

TOTAL SURVEYING, GEOTECHNICAL, ENGINEERING AND CONSTRUCTION COST OPINION =	\$ 152,200
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Millennium Park Trail Expansion - Cost Opinion Worksheet

Project ID: 1914

Project Description: Proposed Millennium Park Connection Spur 2A

INTUITION
LOGIC

SURVEYING

Description	Unit	Quantity	Unit Cost	Sub Total
Boundary and Topo Surveying	ACRE	0.47	\$ 5,000	\$ 2,400
Prepare Easement Plat and Scripts; Title Report	EACH	3	\$ 1,000	\$ 3,000
Construction Staking and As-Built Surveying	ACRE	0.47	\$ 2,500	\$ 1,200
			Subtotal =	\$ 6,600
			Contingency = 15%	\$ 1,000
			TOTAL OPINION OF SURVEYING COST =	\$ 7,600

GEOTECHNICAL

Description	Unit	Quantity	Unit Cost	Sub Total
Field Borings	LF	60	\$ 20	\$ 1,200
Geotechnical Report	LUMP	1	\$ 2,500	\$ 2,500
Global Stability Analysis	EACH	1	\$ 100	\$ 100
			Subtotal =	\$ 3,800
			Contingency = 15%	\$ 600
			TOTAL OPINION OF GEOTECHNICAL COST =	\$ 4,400

ENGINEERING DESIGN AND CONSTRUCTION DOCUMENTS

Description	Unit	Quantity	Unit Cost	Sub Total
Preliminary Design	HOURS	100	\$ 100	\$ 10,000
ROW	HOURS	40	\$ 100	\$ 4,000
Permitting	HOURS	40	\$ 100	\$ 4,000
Final Design	HOURS	60	\$ 100	\$ 6,000
Develop Plans and Construction Documents	HOURS	100	\$ 75	\$ 7,500
Construction Support	HOURS	60	\$ 100	\$ 6,000
			\$ -	\$ -
			Subtotal =	\$ 37,500
			Contingency = 15%	\$ 5,600
			TOTAL OPINION OF ENGINEERING AND CONSTRUCTION OBSERVATION COST =	\$ 43,100

CONSTRUCTION

Description	Unit	Quantity	Unit Cost	Sub Total
Removal of Existing Structures or Trees	EACH	6	\$ 2,000	\$ 12,000
Excavation and Embankment in Place	CY	378	\$ 15	\$ 5,700
Trail Surface (asphalt) 4" thick	SY	529	\$ 40	\$ 21,200
Trail Surface (crushed rock) 4" thick	SY	0	\$ 10	\$ -
Trail aggregate base 4" thick	SY	529	\$ 10	\$ 5,300
Rock Grade Control	CY	0	\$ 75	\$ -
Grade Control Sheet Pile	SF	0	\$ 25	\$ -
Rock Stilling Basin / Outlet Scour Protection	CY	0	\$ 75	\$ -
Rock Toe and Slope Protection	CY	0	\$ 75	\$ -
Riparian Corridor Planting	SF	0	\$ 0.50	\$ -
Site Restoration	ACRE	0.16	\$ 15,000	\$ 2,300
New Culvert	LF	30	\$ 500.0	\$ 15,000
Retaining Wall	SF	400	\$ 50	\$ 20,000
Wetland Planting	ACRE	0.00	\$ 40,000	\$ -
Spillway Repair	SF	0	\$ 15	\$ -
Pedestrian Bridge 14 ft wide, ambulance rated	LF	0	\$ 1,000	\$ -
			\$ -	\$ -
Mobilization and Bond	5%	1	\$ 4,075	\$ 4,100
			Subtotal =	\$ 85,600
			Contingency = 20%	\$ 17,100
			TOTAL OPINION OF CONSTRUCTION COST =	\$ 102,700

TOTAL SURVEYING, GEOTECHNICAL, ENGINEERING AND CONSTRUCTION COST OPINION = \$ 157,800

Millennium Park Trail Expansion - Cost Opinion Worksheet

Project ID: 1914

Project Description: Proposed Millennium Park Connection Spur 3

INTUITION
LOGIC

SURVEYING

Description	Unit	Quantity	Unit Cost	Sub Total
Boundary and Topo Surveying	ACRE	0.80	\$ 5,000	\$ 4,000
Prepare Easement Plat and Scripts; Title Report	EACH	1	\$ 1,000	\$ 1,000
Construction Staking and As-Built Surveying	ACRE	0.80	\$ 2,500	\$ 2,000
			Subtotal =	\$ 7,000
			Contingency = 15%	\$ 1,100
			TOTAL OPINION OF SURVEYING COST =	\$ 8,100

GEOTECHNICAL

Description	Unit	Quantity	Unit Cost	Sub Total
Field Borings	LF	60	\$ 20	\$ 1,200
Geotechnical Report	LUMP	1	\$ 2,500	\$ 2,500
Global Stability Analysis	EACH	1	\$ 100	\$ 100
			Subtotal =	\$ 3,800
			Contingency = 15%	\$ 600
			TOTAL OPINION OF GEOTECHNICAL COST =	\$ 4,400

ENGINEERING DESIGN AND CONSTRUCTION DOCUMENTS

Description	Unit	Quantity	Unit Cost	Sub Total
Preliminary Design	HOURS	100	\$ 100	\$ 10,000
ROW	HOURS	40	\$ 100	\$ 4,000
Permitting	HOURS	40	\$ 100	\$ 4,000
Final Design	HOURS	60	\$ 100	\$ 6,000
Develop Plans and Construction Documents	HOURS	100	\$ 75	\$ 7,500
Construction Support	HOURS	60	\$ 100	\$ 6,000
			\$ -	\$ -
			Subtotal =	\$ 37,500
			Contingency = 15%	\$ 5,600
			TOTAL OPINION OF ENGINEERING AND CONSTRUCTION OBSERVATION COST =	\$ 43,100

CONSTRUCTION

Description	Unit	Quantity	Unit Cost	Sub Total
Removal of Existing Structures or Trees	EACH	6	\$ 2,000	\$ 12,000
Excavation and Embankment in Place	CY	656	\$ 15	\$ 9,800
Trail Surface (asphalt) 4" thick	SY	933	\$ 40	\$ 37,300
Trail Surface (crushed rock) 4" thick	SY	0	\$ 10	\$ -
Trail aggregate base 4" thick	SY	933	\$ 10	\$ 9,300
Rock Grade Control	CY	0	\$ 75	\$ -
Grade Control Sheet Pile	SF	0	\$ 25	\$ -
Rock Stilling Basin / Outlet Scour Protection	CY	0	\$ 75	\$ -
Rock Toe and Slope Protection	CY	0	\$ 75	\$ -
Riparian Corridor Planting	SF	0	\$ 0.50	\$ -
Site Restoration	ACRE	0.28	\$ 15,000	\$ 4,100
New Culvert	LF	0	\$ 500.0	\$ -
Retaining Wall	SF	1,032	\$ 50	\$ 51,600
Wetland Planting	ACRE	0.00	\$ 40,000	\$ -
Spillway Repair	SF	0	\$ 15	\$ -
Pedestrian Bridge 14 ft wide, ambulance rated	LF	0	\$ 1,000	\$ -
			\$ -	\$ -
Mobilization and Bond	5%	1	\$ 6,205	\$ 6,200
			Subtotal =	\$ 130,300
			Contingency = 20%	\$ 26,100
			TOTAL OPINION OF CONSTRUCTION COST =	\$ 156,400

TOTAL SURVEYING, GEOTECHNICAL, ENGINEERING AND CONSTRUCTION COST OPINION =	\$ 212,000
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