Resilience + Sustainability

CITY OF NEW ORLEANS

West End H&H Study Results

October 3, 2024

Presented by: Meagan M. Williams, P.E

Study conducted by Digital Engineering, Inc

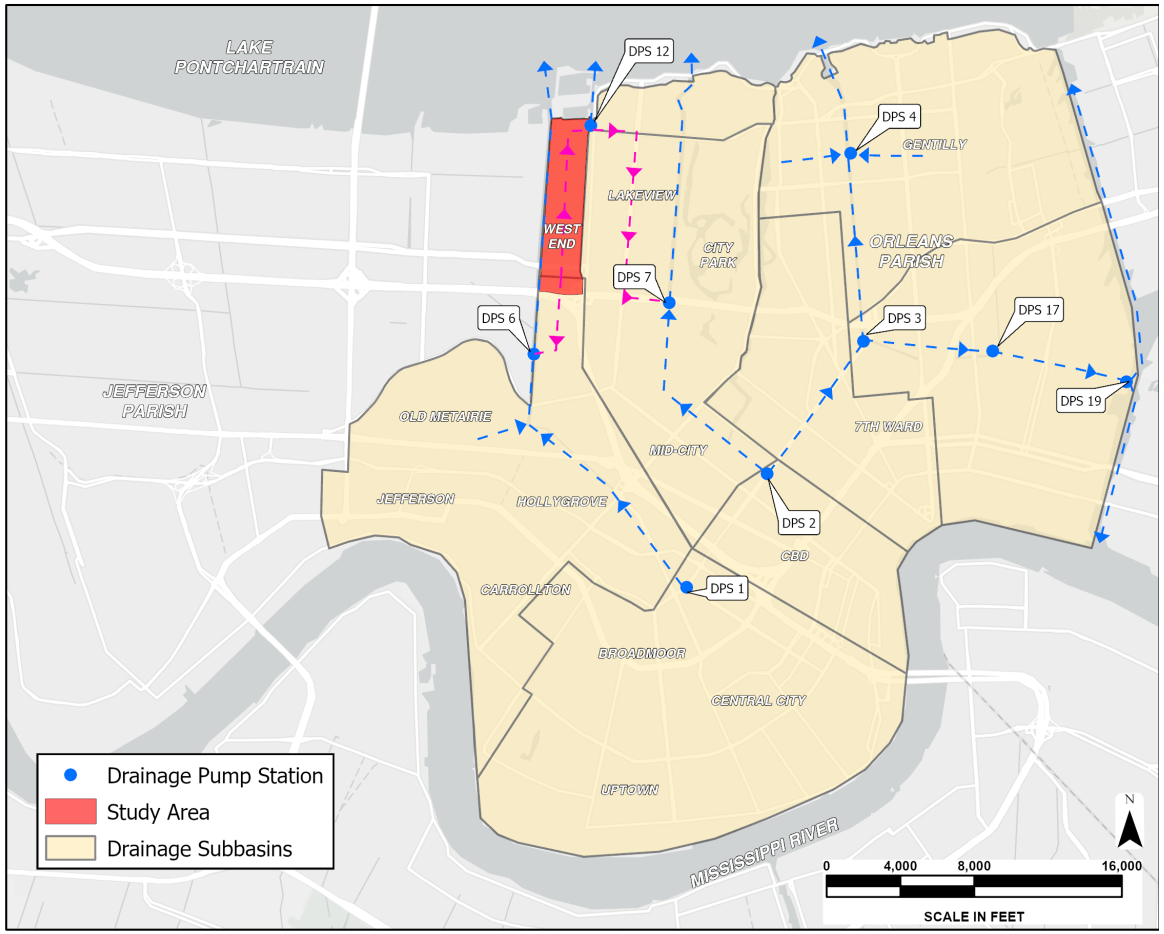
Project Overview

- Project scope intended to conduct neighborhood level investigation (block – by – block)
- Investigate flood risk within neighborhood and evaluate existing system
- Incorporate completed and designed JIRR projects to better understand functionality of system
- Not intended to investigate proposed solutions at pump stations
  - Other efforts currently underway by various parties
- **Goal: Develop 3-5 conceptual projects within the project boundary specifically designed to reduce flooding.**

Drainage characteristics

- Study area is drained by Fleur De Lis Drainage Box Culvert to DPS 12 & 6. (90% drained by gravity to DPS 12)
- Study area is surrounded by high ground (Pontchartrain Blvd., Fleur De Lis, 17th St. Canal, I-10/610 Interchange, Veterans Blvd.)

	DPS 6	DPS 7	DPS 12
Total Area Drained (sqmi)	17.2	8.46	1.63
Additional Basins Drained	DPS 1	DPS 2	West End, Lakeshore



Major drivers of flooding

- Local runoff accounts for only 21% of water in the study area. (79% comes from adjacent subbasins.)
- DPS 12
  - Unmanned station
  - Doesn't kick on until Fleur De Lis Drainage Box is 82% full.
- Key Takeaways:
  - Fleur De Lis Drainage Box provides sufficient conveyance capacity.
  - Determine solutions that store stormwater where it falls

Inundation Map – 10 year (Existing Conditions)

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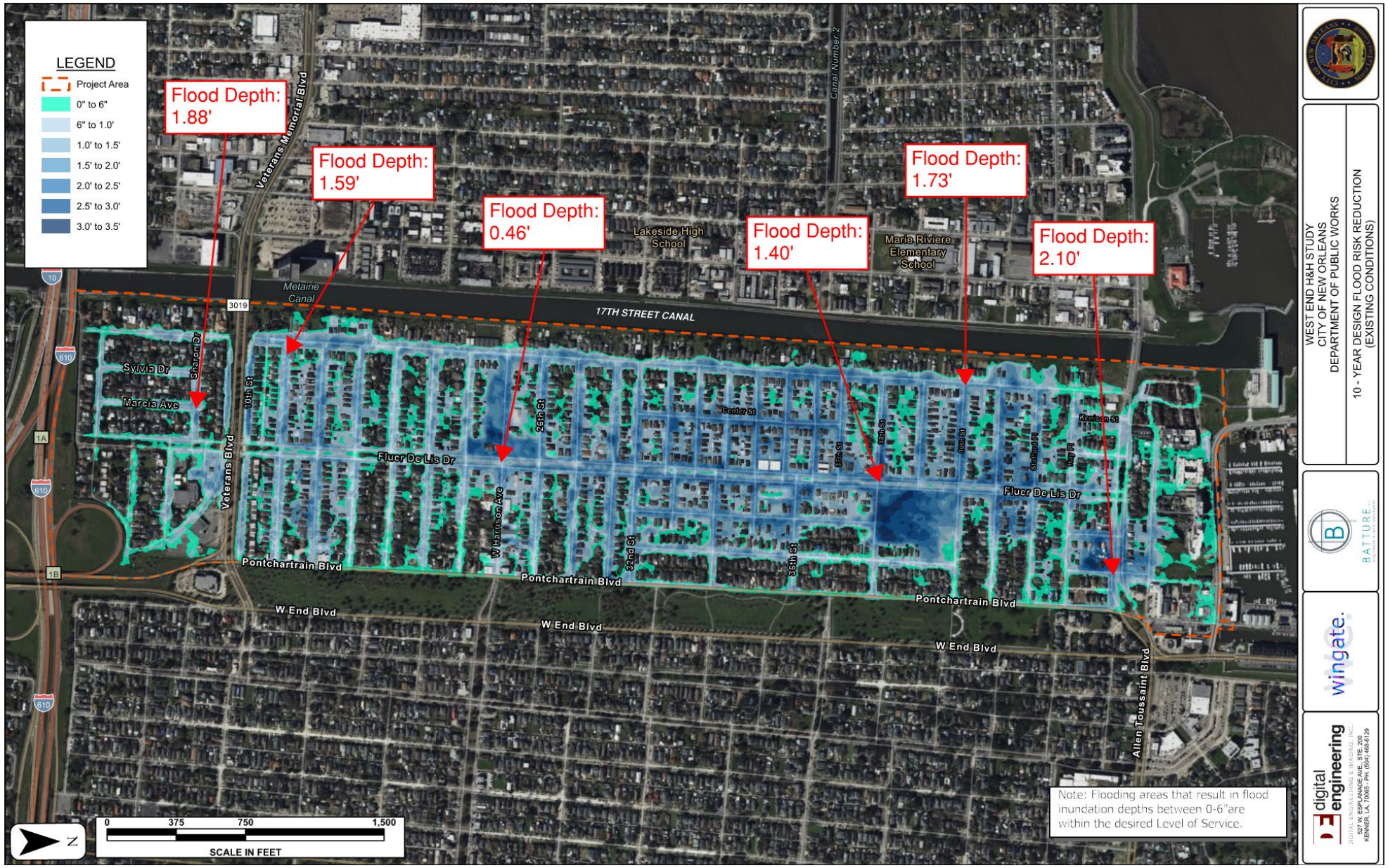

Project Alternatives Overview Map

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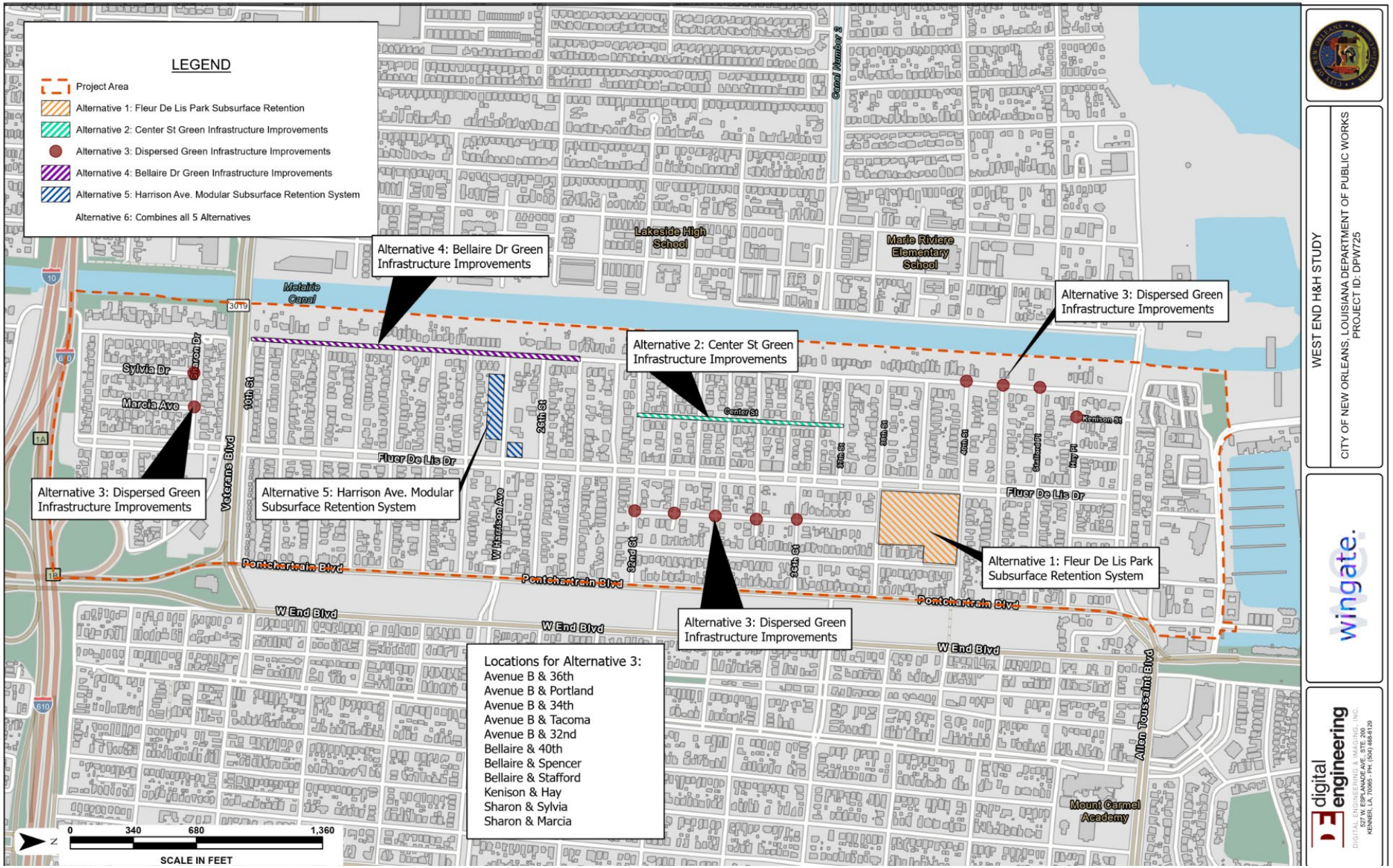

Proposed Alt. No. 1 - Overview Map

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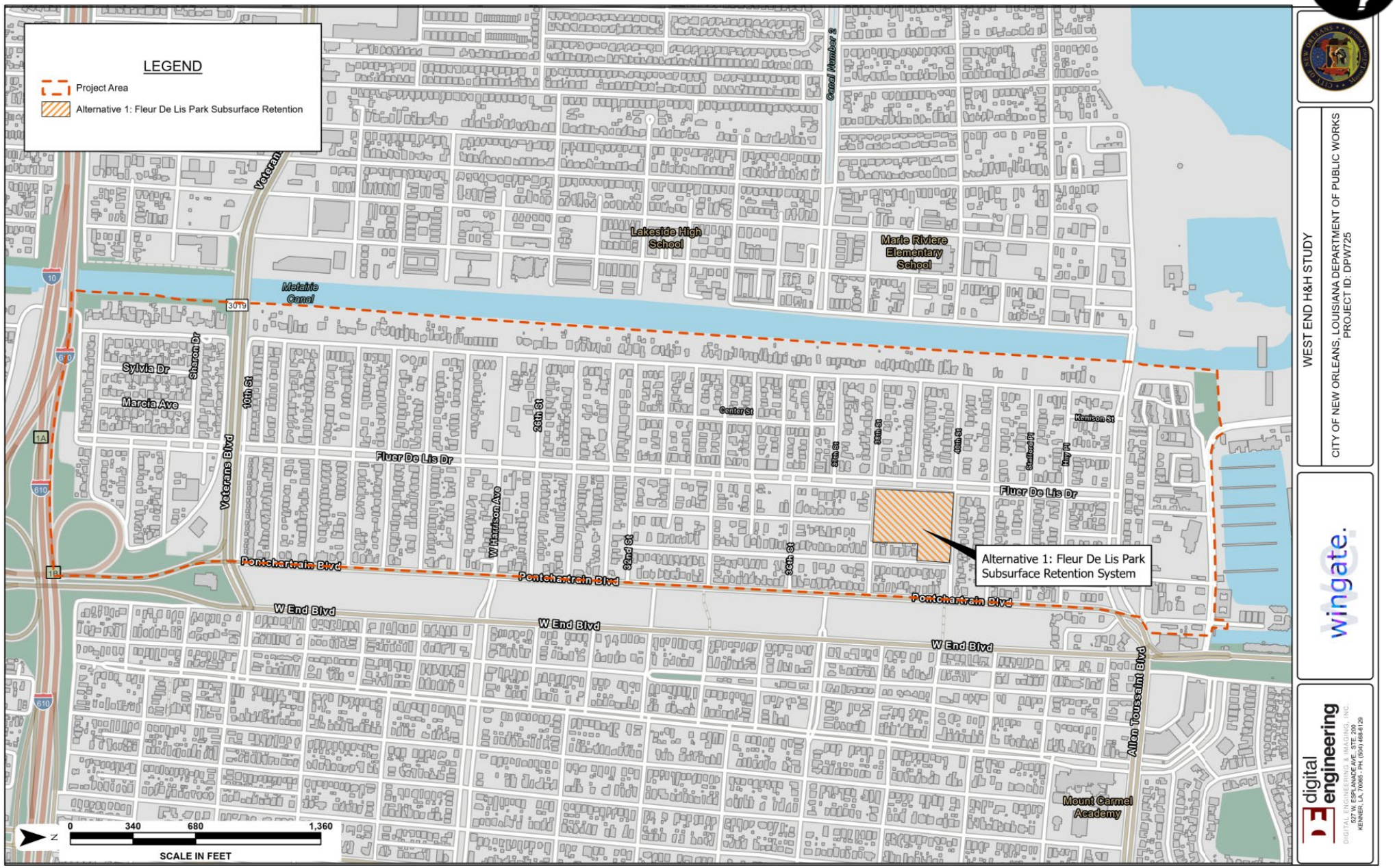

Proposed Alt. No. 1
Modular Tank System

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- Modular tank system at Fleur De lis Park
  - See Hagan Lafitte
- Flood reduction values:
  - Max. Water Surface Elevation Decrease of **1.66'**
  - Average WSE Decrease **0.31'**
- Cost estimate:$11,096,030.52

Proposed Alt. No. 1 – Flood Risk Reduction

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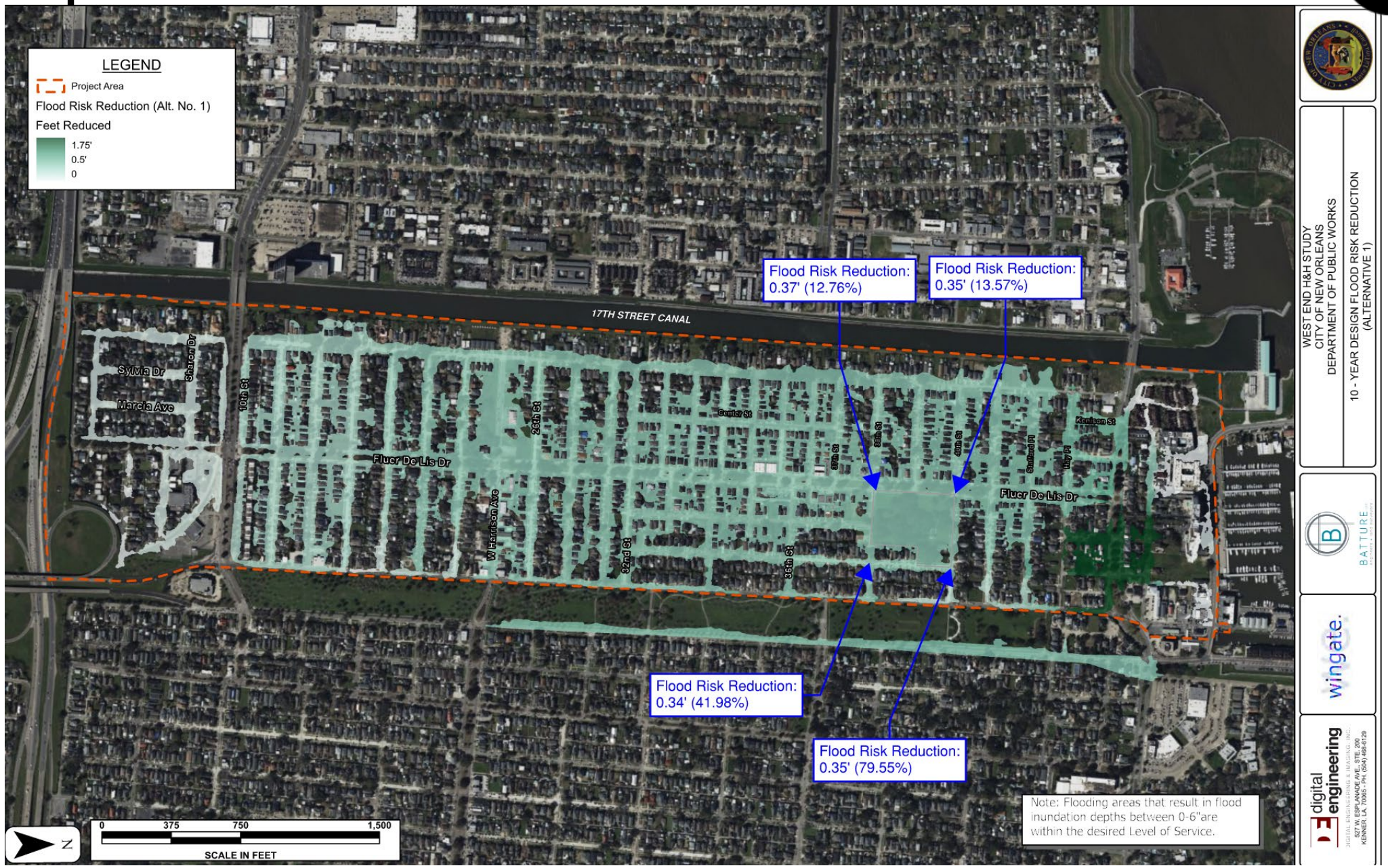

WEST END H&H STUDY
CITY OF NEW ORLEANS
DEPARTMENT OF PUBLIC WORKS

10 - YEAR DESIGN FLOOD RISK REDUCTION
(ALTERNATIVE 1)

BATTURE

wingate.

digital engineering

Proposed Alt. No. 1 – Line Item Cost Estimate

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CNO West End H&H Study
Engineer's Opinion of Probable Construction Cost[1]
Alternative No. 1: Proposed Installation of Modular Subsurface Retention Systems at Fleur de Lis Park

ITEM NO.	ITEM OF WORK	UNIT	QUANTITY	UNIT PRICE	ESTIMATED TOTAL PRICE
1	Mobilization and Demobilization	LS	1.00	$380,000.00	$380,000.00
2	Sediment Erosion Control	LS	1.00	$5,000.00	$5,000.00
3	Removal of Structures and Obstructions[2]	LS	1.00	$50,000.00	$50,000.00
4	Tree Trimming	LS	1.00	$50,000.00	$50,000.00
5	Root Pruning	EACH	20.00	$1,500.00	$30,000.00
6	Removal of Existing Tree	EACH	20.00	$7,000.00	$140,000.00
7	Removal and Disposal of Existing Pavements (Portland Cement Concrete Pavement, Asphaltic Concrete Pavement, Composite Pavement)	SY	1,000.00	$24.00	$24,000.00
8	Roadway Excavation	CY	222.00	$52.00	$11,544.00
9	Superpave Asphaltic Concrete (2.5" Thick)	SY	531.00	$35.00	$18,585.00
10	Asphaltic Binder (4.5" Thick)	SY	358.00	$58.00	$20,764.00
11	Cold Planning Asphaltic Pavement (2.5" Average)	SY	77.00	$12.00	$924.00
12	Reinforced Concrete Pavement (8" Thick)	SY	640.00	$150.00	$96,000.00
13	Removal and Disposal of Existing Sidewalk, Driveway, Foot Lap (Concrete, Brick, Asphalt, etc.)	SY	49.00	$30.00	$1,470.00
14	Concrete Sidewalk (4" Thick)	SY	36.75	$92.00	$3,381.00
15	Concrete Driveway (6" Thick)	SY	12.25	$112.00	$1,372.00
16	Removal of Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections Including Saw Cutting	SY	167.00	$60.00	$10,020.00
17	Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections	SY	167.00	$250.00	$41,750.00
18	Surface Applied Tactile / Detectable Warning Surface Tiles	SF	160.00	$60.00	$9,600.00
19	Removal and Disposal of Existing Curb and/or Gutter (Concrete, Asphalt, Brick, etc.)	LF	750.00	$9.00	$6,750.00
20	Furnish and Install Concrete Curb and/or Gutter	LF	750.00	$30.00	$22,500.00
21	Batture Sand for Dressing, Granular Material for other Adjustments	CY	57.00	$20.00	$1,140.00
22	Geotextile Fabric for Stabilization	SY	1,680.00	$2.50	$4,200.00
23	Geogrid	SY	1,551.00	$3.50	$5,428.50
24	Base Course	CY	345.00	$105.00	$36,225.00
25	Reinforced Conrete Pipe (18", Class III, Solid)	LF	85.00	$340.00	$28,900.00
26	Reinforced Concrete Pipe (36", Class III, Solid)	LF	218.00	$470.00	$102,460.00
27	Reinforced Concrete Pipe (42". Class III, Solid)	LF	448.00	$510.00	$228,480.00
28	8" Waterline Offset Up to 24"	EACH	4.00	$9,800.00	$39,200.00
29	Replace Existing Sewer House Connections (from Exist/New Main to Property Line)	EACH	3.00	$7,000.00	$21,000.00
30	No. 1 Standard Drain Manhole	FH	32.00	$750.00	$24,000.00
31	Subsurface Stormwater Storage - Fleur De Lis Park[3]	CF	447,629.00	$12.00	$5,371,548.00
32	Subsurface Stormwater Storage Control Structure	EACH	7.00	$20,000.00	$140,000.00
33	Inline Check Valve (18")	EACH	1.00	$10,000.00	$10,000.00
34	Removal and Disposal of Excavated Material (Net Section)	CY	40,391.00	$20.00	$807,820.00
35	Hydroseeding	SF	136,343.00	$0.20	$27,268.60
36	Construction Layout	LS	1.00	$10,000.00	$10,000.00
37	Pre-construction Video	LS	1.00	$10,000.00	$10,000.00
38	Temporary Signs and Barricades	LS	1.00	$7,000.00	$7,000.00
39	Turf Grass (Bermuda)	SY	62.00	$12.00	$744.00
40	Large Trees	EA	500.00	$12.00	$6,000.00
41	Small Trees	EA	200.00	$50.00	$10,000.00
42	Tree Protection Fencing	LF	5.00	$57.00	$285.00
43	Pine Straw Mulch	SY	7.20	$62.00	$446.40
				SUBTOTAL	**$7,815,805.50**
				CONTIGENCY (30%)	**$2,344,741.65**
				TOTAL ESTIMATED CONSTRUCTION COST	**$10,160,547.15**
				PROJECT DELIVERY COSTS[4]	**$935,483.37**
				PROJECT GRAND TOTAL	**$11,096,030.52**

Notes:

1. Quantities were developed at a 10% Conceptual level of effort and were developed with Conceptual Plan Sheets of the project alternative concept. Unit price values are estimated during the year 2024. These unit price values may increase over time.
2. Removal of Structures and Obstructions includes the removal of park features within the limits of Fleur de Lis Park (fence backstop, kid's playground, basketball court).
3. Subsurface Stormwater Storage includes all labor, materials, and equipment required to excavate, furnish, and install modular subsurface retention system. Cost excludes the hauling away of spoils from excavation.
4. Project delivery includes basic Professional Engineering Services and Permitting, Surveying, Geotechnical Investigation, Construction Admin., Resident Inspection, and Materials Testing.

Project Cost:

- Construction: $ 10,160,547.15
- Soft Costs (Design): $935,483.37
- Total Project Cost: $11,096,030.52

Percent Dollars of:

Gray Infrastructure Upgrades: 6%

GI Investment: 94%

Proposed Alt. No. 2 - Overview Map

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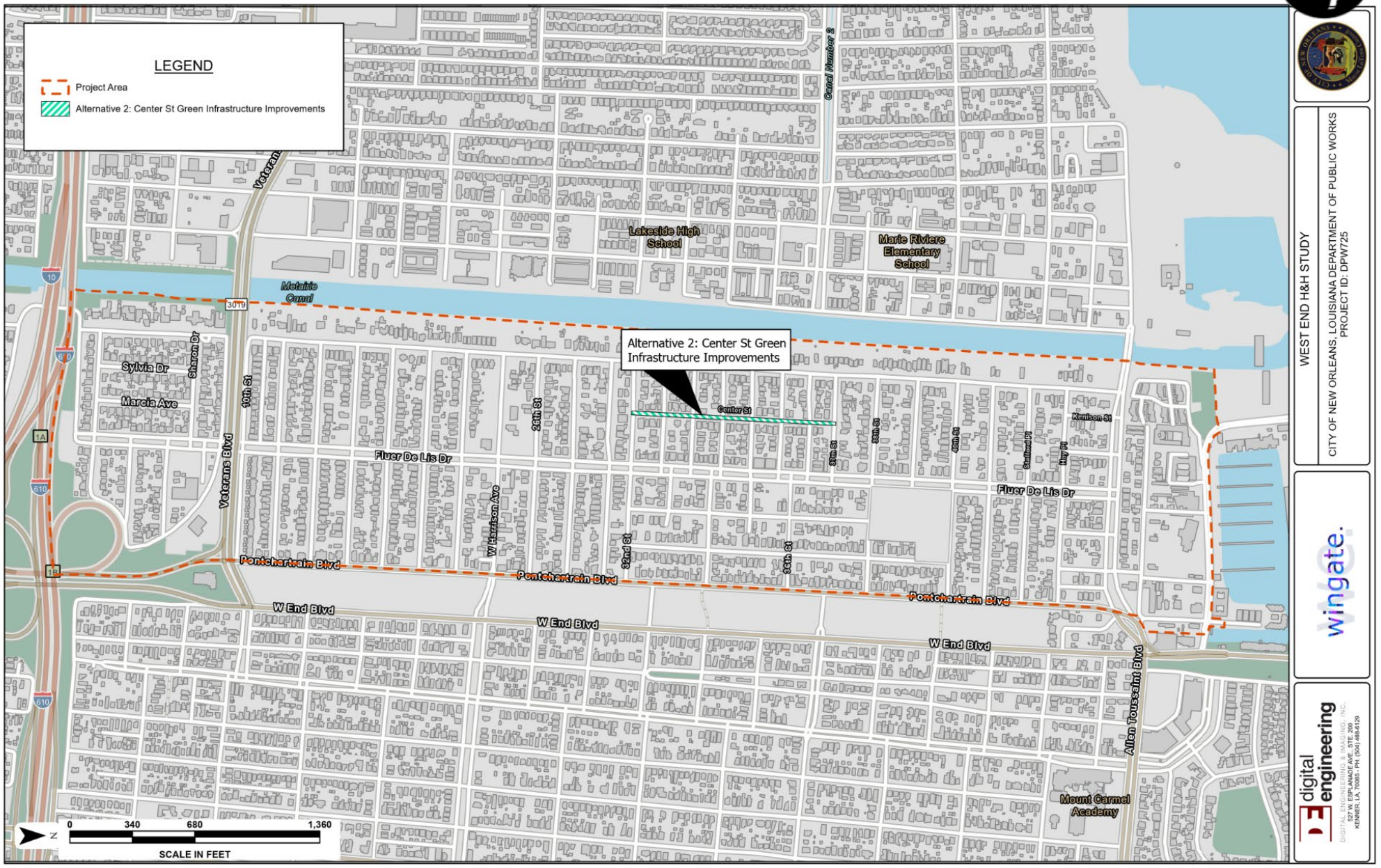

Proposed Alt. No. 2
Center Street GI Improvements

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- Proposed Permeable Pavers & Infiltration Trench
- Flood reduction values:
  - Max. Water Surface elevation (WSE) Decrease of 0.02’
  - Average WSE Decrease 0.00’
- Cost estimate: $8,603,439.49

Proposed Alt. No. 2 – Flood Risk Reduction

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Proposed Alt. No. 2- Line Item Cost Estimate

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CNO West End H&H Study
Engineer's Opinion of Probable Construction Cost[1]
Alternative No. 2: Proposed Installation of Infiltration Trenches on Center St. (Between 32nd & 37th St.)

ITEM NO.	ITEM OF WORK	UNIT	QUANTITY	UNIT PRICE	ESTIMATED TOTAL PRICE
1	Mobilization and Demobilization	LS	1.00	$290,000.00	$290,000.00
2	Sediment Erosion Control	LS	1.00	$5,000.00	$5,000.00
3	Tree Trimming	LS	1.00	$10,000.00	$10,000.00
4	Root Pruning	EACH	40.00	$1,500.00	$60,000.00
5	Roadway Excavation	CY	1,186.00	$52.00	$61,672.00
6	Removal and Disposal of Existing Pavements (Portland Cement Concrete Pavement, Asphaltic Concrete Pavement, Composite Pavement)	SY	4,980.00	$24.00	$119,520.00
7	Superpave Asphaltic Concrete (2.5" Thick)	SY	3,812.00	$35.00	$133,420.00
8	Asphaltic Binder (4.5" Thick)	SY	3,812.00	$58.00	$221,096.00
9	Removal and Disposal of Existing Sidewalk, Driveway, Foot Lap (Concrete, Brick, Asphalt, etc.)	SY	2,394.00	$30.00	$71,820.00
10	Concrete Sidewalk (4" Thick)	SY	1,795.50	$92.00	$165,186.00
11	Concrete Driveway (6" Thick)	SY	598.50	$112.00	$67,032.00
12	Removal of Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections Including Saw Cutting	SY	467.00	$60.00	$28,020.00
13	Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections	SY	467.00	$250.00	$116,750.00
14	Surface Applied Tactile / Detectable Warning Surface Tiles	SF	448.00	$60.00	$26,880.00
15	Removal and Disposal of Existing Curb and/or Gutter (Concrete, Asphalt, Brick, etc.)	LF	4,290.00	$9.00	$38,610.00
16	Furnish and Install Concrete Curb and/or Gutter	LF	4,290.00	$30.00	$128,700.00
17	Permeable Articulating Concrete Block	SY	1,644.00	$325.00	$534,300.00
18	Bridging Course Aggregate (No. 8 Washed Stone)	CY	1,244.00	$192.00	$238,848.00
19	Bridging Course Aggregate (No. 57 Washed Stone)	CY	622.00	$140.00	$87,080.00
20	Geotextile Fabric for Stabilization	SY	4,956.00	$2.50	$12,390.00
21	Geogrid	SY	4,575.00	$3.50	$16,012.50
22	Base Course	CY	1,276.00	$105.00	$133,980.00
23	Geosynthetic (Impermeable Membrane)	SY	2,802.00	$10.00	$28,020.00
24	Structural Concrete	CY	195.00	$1,200.00	$234,000.00
25	Underdrain Pipe - Perforated (PVC, 6")	LF	1,065.00	$125.00	$133,125.00
26	Reinforced Conrete Pipe (15", Class III, Solid)	LF	270.00	$305.00	$82,350.00
27	Reinforced Conrete Pipe (24", Class III, Solid)	LF	1,270.00	$380.00	$482,600.00
28	8" PVC New Water Main with Main Line Fittings	LF	1,668.00	$400.00	$667,200.00
29	Install Sewer Main (8", 6.1' - 8.0' Deep)	LF	1,652.00	$370.00	$611,240.00
30	24" X 30" Clear Opening Standard Drop Inlet	EACH	8.00	$8,000.00	$64,000.00
31	No. 1 Standard Catch Basin	EACH	18.00	$5,900.00	$106,200.00
32	No. 1 Standard Drain Manhole	FH	72.00	$750.00	$54,000.00
33	Install Sewer Manhole	FH	72.00	$825.00	$59,400.00
34	New 8" Valve	EACH	14.00	$10,000.00	$140,000.00
35	Remove Mud and Debris from Inside of Water Meter Box	EACH	12.00	$200.00	$2,400.00
36	Adjust Complete Water Meter Box to Grade	EACH	12.00	$400.00	$4,800.00
37	Replace Broken Water Meter Box (5/8") To (1")	EACH	25.00	$1,200.00	$30,000.00
38	New Fire Hydrant	EACH	8.00	$10,000.00	$80,000.00
39	Replace 5/8" to 1" Water House Connection (from Main to Meter)	EACH	49.00	$5,000.00	$245,000.00
40	Replace Existing Sewer House Connections (from Exist/New Main to Property Line)	EACH	49.00	$7,000.00	$343,000.00
41	Construction Layout	LS	1.00	$10,000.00	$10,000.00
42	Pre-construction Video	LS	1.00	$10,000.00	$10,000.00
43	Temporary Signs and Barricades	LS	1.00	$7,000.00	$7,000.00
				SUBTOTAL	**$5,960,651.50**
				CONTIGENCY (30%)	**$1,788,195.45**
				TOTAL ESTIMATED CONSTRUCTION COST	**$7,748,846.95**
				PROJECT DELIVERY COST[2]	**$854,592.54**
				PROJECT GRAND TOTAL	**$8,603,439.49**

Notes:

1. Quantities were developed at a 10% Conceptual level of effort and were developed with Conceptual Plan Sheets of the project alternative concept. Unit price values are estimated during the year 2024. These unit price values may increase over time.

2. Project delivery includes basic Professional Engineering Services and Permitting, Surveying, Geotechnical Investigation, Construction Admin., Resident Inspection, and Materials Testing.

<u>Project Cost:</u>

- Construction: $7,748,846.95
- Soft Costs (Design): $854,592.54
- Total Project Cost: $8,603,439.49

Percent Dollars of:

Gray Infrastructure Upgrades: 70%

GI Investment: 30%

Proposed Alt. No. 3 - Overview Map

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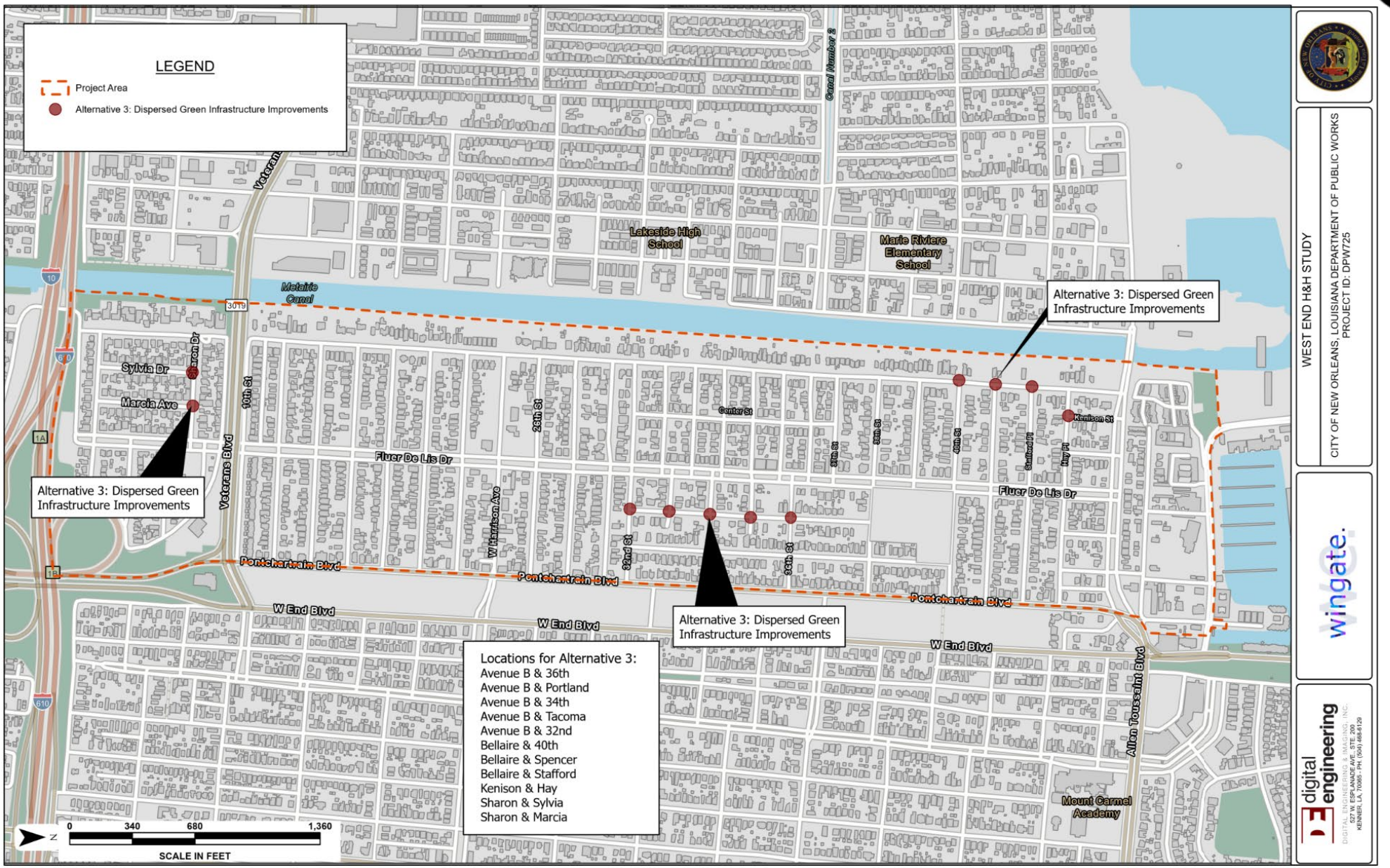

Proposed Alt. No. 3
Dispersed GI Improvements

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- Proposed Permeable Paver Intersection, Curb Extensions w/ Bioretention Cells

- Flood reduction values:
  - Max. WSE Decrease of 0.40’
  - Average WSE Decrease 0.19’

- Cost estimate: $12,576,543.61

Proposed Alt. No. 3 – Flood Risk Reduction

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WEST END H&H STUDY
CITY OF NEW ORLEANS
DEPARTMENT OF PUBLIC WORKS

10 - YEAR DESIGN FLOOD RISK REDUCTION (ALTERNATIVE 3)

BATTURE

wingate.

digital engineering

Proposed Alt. No. 3 - Line Item Cost Estimate

Resilience + Sustainability
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CNO West End H&H Study
Engineer's Opinion of Probable Construction Cost[1]
Alternative No. 3: Proposed Installation of Intersection Bulb-Outs in West End Neighborhood (11 Total Intersections)

ITEM NO.	ITEM OF WORK	UNIT	QUANTITY	UNIT PRICE	ESTIMATED TOTAL PRICE
1	Mobilization and Demobilization	LS	1.00	$440,000.00	$440,000.00
2	Sediment Erosion Control	LS	1.00	$5,000.00	$5,000.00
3	Tree Trimming	LS	1.00	$30,000.00	$30,000.00
4	Roadway Excavation	CY	5,295.00	$52.00	$275,340.00
5	Removal of Existing Tree	EACH	1.00	$7,000.00	$7,000.00
6	Removal and Disposal of Existing Sidewalk, Driveway, Foot Lap (Concrete, Brick, Asphalt, etc.)	SY	1,423.00	$30.00	$42,690.00
7	Concrete Sidewalk (4" Thick)	SY	1,067.25	$92.00	$98,187.00
8	Concrete Driveway (6" Thick)	SY	355.75	$112.00	$39,844.00
9	Removal of Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections Including Saw Cutting	SY	534.00	$60.00	$32,040.00
10	Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections	SY	534.00	$250.00	$133,500.00
11	Surface Applied Tactile / Detectable Warning Surface Tiles	SF	512.00	$60.00	$30,720.00
12	Removal and Disposal of Existing Pavements (Portland Cement Concrete Pavement, Asphaltic Concrete Pavement, Composite Pavement)	SY	5,100.00	$24.00	$122,400.00
13	Porous Concrete Panel	SY	5,100.00	$440.00	$2,244,000.00
14	Removal and Disposal of Existing Curb and/or Gutter (Concrete, Asphalt, Brick, etc.)	LF	3,200.00	$9.00	$28,800.00
15	Furnish and Install Concrete Curb and/or Gutter	LF	3,200.00	$30.00	$96,000.00
16	Geotextile Fabric for Stabilization	SY	22,872.00	$2.50	$57,180.00
17	Geogrid	SY	20,966.00	$3.50	$73,381.00
18	Geosynthetic (Subsurface Drainage Application, Class 1, Non-Woven)	SY	5,547.00	$6.00	$33,282.00
19	Geosynthetic (Impermeable Membrane)	SY	3,965.00	$10.00	$39,650.00
20	Pine Straw Mulch	SY	3,050.00	$10.00	$30,500.00
21	Bioretention Media (Soil Mix)	SY	2,312.00	$175.00	$404,600.00
22	Bridging Course Aggregate (No. 57 Washed Stone)	CY	2,033.00	$140.00	$284,620.00
23	Bridging Course Aggregate (No. 8 Washed Stone)	CY	678.00	$192.00	$130,176.00
24	Underdrain Pipe - Perforated (PVC, 6")	LF	3,750.00	$125.00	$468,750.00
25	Reinforced Concrete Pipe (15", Class III, Solid)	LF	820.00	$305.00	$250,100.00
26	No. 1 Standard Drain Manhole	FH	120.00	$750.00	$90,000.00
27	Install Sewer Manhole	FH	88.00	$825.00	$72,600.00
28	New 8" Valve	EACH	22.00	$10,000.00	$220,000.00
29	Remove Mud and Debris from Inside of Water Meter Box	EACH	8.00	$200.00	$1,600.00
30	Adjust Complete Water Meter Box to Grade	EACH	8.00	$400.00	$3,200.00
31	Replace Broken Water Meter Box (5/8") To (1")	EACH	15.00	$1,200.00	$18,000.00
32	New Fire Hydrant	EACH	11.00	$10,000.00	$110,000.00
33	Replace 5/8" to 1" Water House Connection (from Main to Meter)	EACH	30.00	$5,000.00	$150,000.00
34	Replace Existing Sewer House Connections (from Exist/New Main to Property Line)	EACH	30.00	$7,000.00	$210,000.00
35	8" PVC New Water Main with Main Line Fittings	LF	2,190.00	$400.00	$876,000.00
36	Install Sewer Main (8", 6.1' - 8.0' Deep)	LF	2,215.00	$370.00	$819,550.00
37	Construction Layout	LS	1.00	$10,000.00	$10,000.00
38	Pre-construction Video	LS	1.00	$10,000.00	$10,000.00
39	Temporary Signs and Barricades	LS	1.00	$2,000.00	$2,000.00
40	Bioretention Plantings (3 Gal.)	EACH	$50.00	5,364.00	$268,200.00
41	Bioretention Plantings (1 Gal.)	EACH	$25.00	16,092.00	$402,300.00
42	Rain Garden Excavation	CY	$41.00	1,987.00	$81,467.00
				SUBTOTAL	**$8,742,677.00**
				CONTIGENCY (30%)	**$2,622,803.10**
				TOTAL ESTIMATED CONSTRUCTION COST	**$11,365,480.10**
				PROJECT DELIVERY COST[2]	**$1,211,063.51**
				PROJECT GRAND TOTAL	**$12,576,543.61**

Notes:

1. Quantities were developed at a 10% Conceptual level of effort and were developed with Conceptual Plan Sheets of the project alternative concept. Unit price values are estimated during the year 2024. These unit price values may increase over time.

2. Project delivery includes basic Professional Engineering Services and Permitting, Surveying, Geotechnical Investigation, Construction Admin., Resident Inspection, and Materials Testing.

Project Cost:

- Construction: $11,365,480.10
- Soft Costs (Design): $1,211,063.51
- Total Project Cost: $12,576,543.61

Percent Dollars of:

Gray Infrastructure Upgrades: 71%

GI Investment: 29%

Proposed Alt. No. 4 - Overview Map

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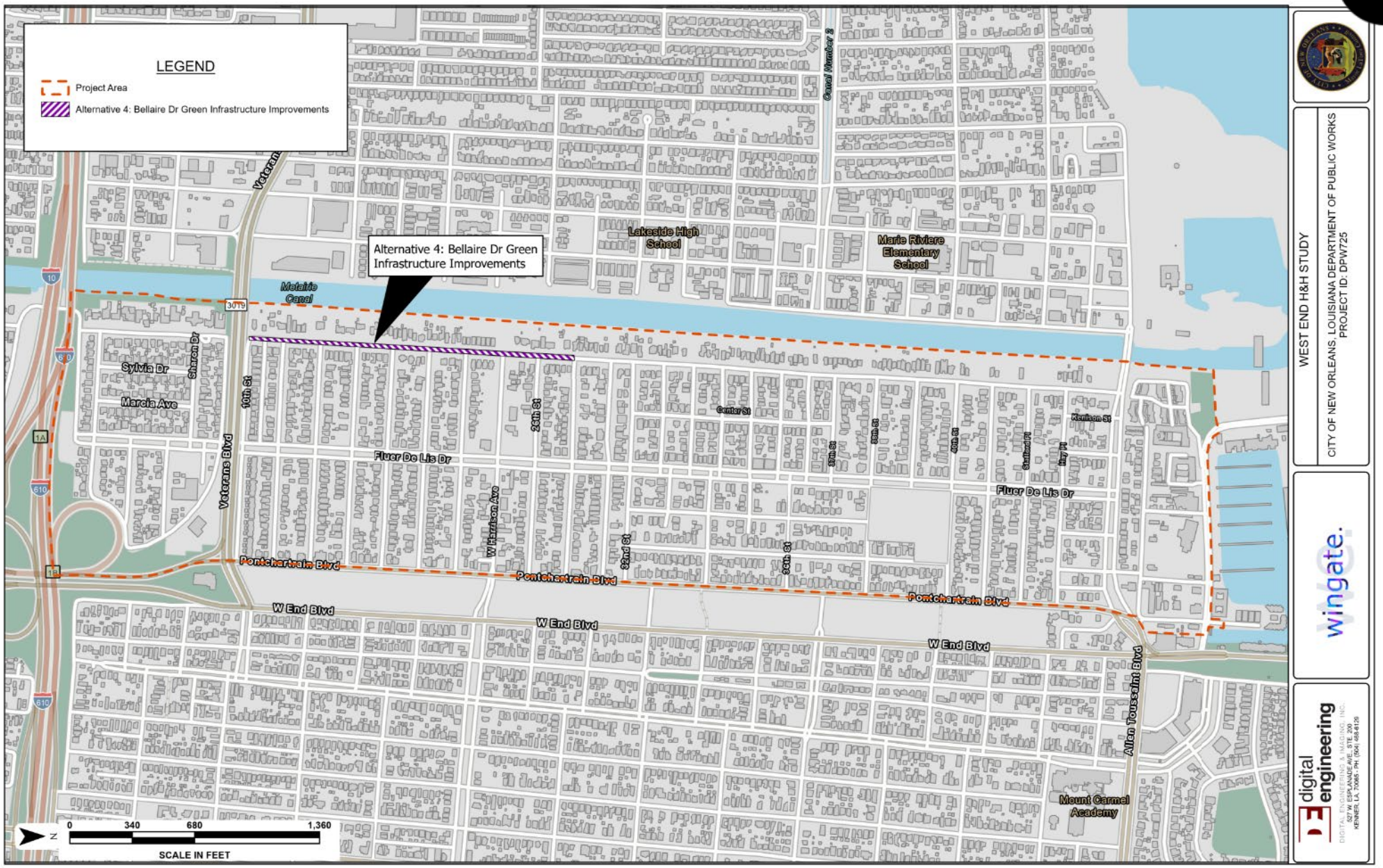

Proposed Alt. No. 4
Bellaire Dr. GI Improvements

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- Bioretention Cells
  - Road Diet
    - Reduce Current 50’ ROW to Standard 26’ ROW Width

- Flood reduction values:
  - Max. WSE Decrease of 0.40’
  - Average WSE Decrease 0.19’
- Cost estimate: $14,476,317.58

Proposed Alt. No. 4 – Flood Risk Reduction

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Proposed Alt. No. 4- Line Item Cost Estimate

Resilience + Sustainability
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CNO West End H&H Study
Engineer's Opinion of Probable Construction Cost[1]
Alternative No. 4: Proposed Installation of Bioretention Cells on Bellaire Dr. (Between 10th & 28th St.)

ITEM NO.	ITEM OF WORK	UNIT	QUANTITY	UNIT PRICE	ESTIMATED TOTAL PRICE
1	Mobilization and Demobilization	LS	1.00	$490,000.00	$490,000.00
2	Sediment Erosion Control	LS	1.00	$5,000.00	$5,000.00
3	Tree Trimming	LS	1.00	$70,000.00	$70,000.00
4	Removal of Existing Tree	EACH	7.00	$7,000.00	$49,000.00
5	Removal and Disposal of Existing Pavements (Portland Cement Concrete Pavement, Asphaltic Concrete Pavement, Composite Pavement)	SY	12,548.00	$24.00	$301,152.00
6	Roadway Excavation	CY	2,788.44	$52.00	$144,999.11
7	Reinforced Concrete Pavement (8" Thick)	SY	7,768.00	$150.00	$1,165,200.00
8	Removal and Disposal of Existing Sidewalk, Driveway, Foot Lap (Concrete, Brick, Asphalt, etc.)	SY	2,361.00	$30.00	$70,830.00
9	Concrete Sidewalk (4" Thick)	SY	1,770.75	$92.00	$162,909.00
10	Concrete Driveway (6" Thick)	SY	590.25	$112.00	$66,108.00
11	Removal of Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections Including Saw Cutting	SY	300.00	$60.00	$18,000.00
12	Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections	SY	300.00	$250.00	$75,000.00
13	Surface Applied Tactile / Detectable Warning Surface Tiles	SF	288.00	$60.00	$17,280.00
14	Removal and Disposal of Existing Curb and/or Gutter (Concrete, Asphalt, Brick, etc.)	LF	7,804.00	$9.00	$70,236.00
15	Furnish and Install Concrete Curb and/or Gutter	LF	7,804.00	$30.00	$234,120.00
16	Geotextile Fabric for Stabilization	SY	10,099.00	$2.50	$25,247.50
17	Geogrid	SY	9,322.00	$3.50	$32,627.00
18	Base Course	CY	2,072.00	$105.00	$217,560.00
19	Reinforced Conrete Pipe (15", Class III, Solid)	LF	3,523.00	$305.00	$1,074,515.00
20	Bioretention Media (Soil Mix)	CY	1,233.00	$175.00	$215,775.00
21	Bridging Course Aggregate (No. 8 Washed Stone)	CY	1,233.00	$192.00	$236,736.00
22	Bridging Course Aggregate (No. 57 Washed Stone)	CY	3,699.00	$140.00	$517,860.00
23	Geosynthetic (Subsurface Drainage Application, Class 1, Non-Woven)	SY	6,657.00	$6.00	$39,942.00
24	Underdrain Pipe - Perforated (PVC, 6")	LF	956.00	$125.00	$119,500.00
25	Pine Straw Mulch	SY	5,547.00	$10.00	$55,470.00
26	Splash Pad, Rip Rap (Class A)	CY	45.00	$300.00	$13,500.00
27	Drain Inlets for Green Infrastructure Facilities (Domed Drain Inlet)	EACH	24.00	$3,500.00	$84,000.00
28	8" PVC New Water Main with Main Line Fittings	LF	2,683.00	$400.00	$1,073,200.00
29	Install Sewer Main (8", 6.1' - 8.0' Deep)	LF	2,517.00	$370.00	$931,290.00
30	No. 1 Standard Catch Basin	EACH	14.00	$5,900.00	$82,600.00
31	No. 1 Standard Drain Manhole	FH	152.00	$750.00	$114,000.00
32	Install Sewer Manhole	FH	96.00	$825.00	$79,200.00
33	New 8" Valve	EACH	18.00	$10,000.00	$180,000.00
34	Remove Mud and Debris from Inside of Water Meter Box	EACH	22.00	$200.00	$4,400.00
35	Adjust Complete Water Meter Box to Grade	EACH	22.00	$400.00	$8,800.00
36	Replace Broken Water Meter Box (5/8") To (1")	EACH	45.00	$1,200.00	$54,000.00
37	Replace 5/8" to 1" Water House Connection (from Main to Meter)	EACH	89.00	$5,000.00	$445,000.00
38	Replace Existing Sewer House Connections (from Exist/New Main to Property Line)	EACH	89.00	$7,000.00	$623,000.00
39	Sodding	SY	1,078.00	$18.00	$19,404.00
40	Construction Layout	LS	1.00	$10,000.00	$10,000.00
41	Pre-construction Video	LS	1.00	$10,000.00	$10,000.00
42	Temporary Signs and Barricades	LS	1.00	$10,000.00	$10,000.00
43	Rain Garden Excavation	CY	2,750.00	$41.00	$112,750.00
44	Turf Grass (Bermuda)	SY	95.00	$12.00	$1,140.00
45	Large Trees	EACH	15.00	$500.00	$7,500.00
46	Small Trees	EACH	31.00	$200.00	$6,200.00
47	Bioretention Plantings (3 Gal.)	EACH	7,426.00	$50.00	$371,300.00
48	Bioretention Plantings (1 Gal.)	EACH	22,278.00	$25.00	$556,950.00
				SUBTOTAL	**$10,273,300.61**
				CONTIGENCY (30%)	**$3,081,990.18**
				TOTAL ESTIMATED CONSTRUCTION COST	**$13,355,290.79**
				PROJECT DELIVERY COST[2]	**$1,406,026.79**
				PROJECT GRAND TOTAL	**$14,761,317.58**

Notes:
1. Quantities were developed at a 10% Conceptual level of effort and were developed with Conceptual Plan Sheets of the project alternative concept. Unit price values are estimated during the year 2024. These unit price values may increase over time.
2. Project delivery includes basic Professional Engineering Services and Permitting, Surveying, Geotechnical Investigation, Construction Admin., Resident Inspection, and Materials Testing.

Project Cost:

- Construction: $13,355,290.79
- Soft Costs (Design): $1,406,026.79
- Total Project Cost: $14,761,317.38

Percent Dollars of:

Infrastructure Upgrades: 64%

GI Investment: 36%

Proposed Alt. No. 5 - Overview Map

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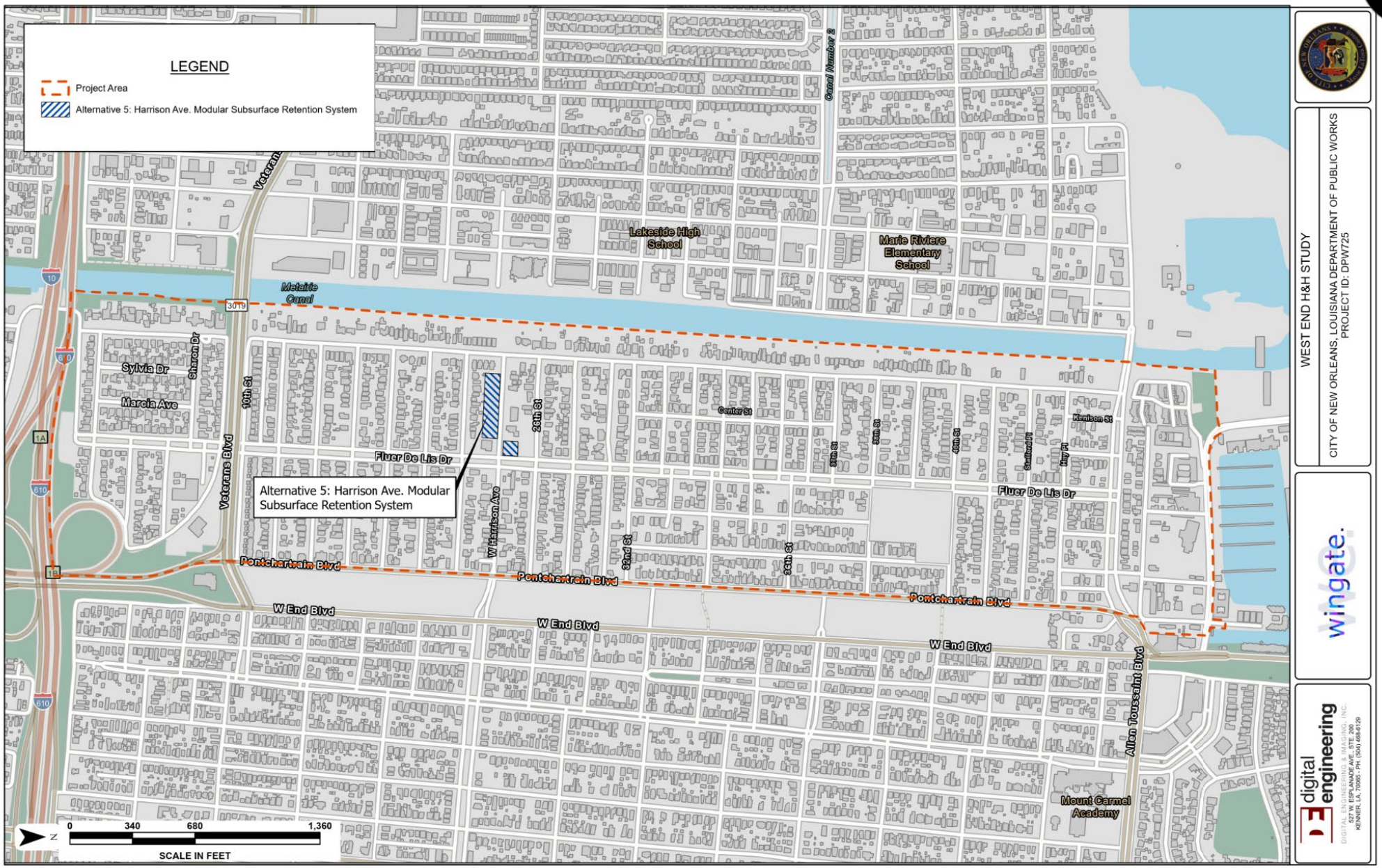

Proposed Alt. No. 5
W. Harrison Ave. Modular Tank System

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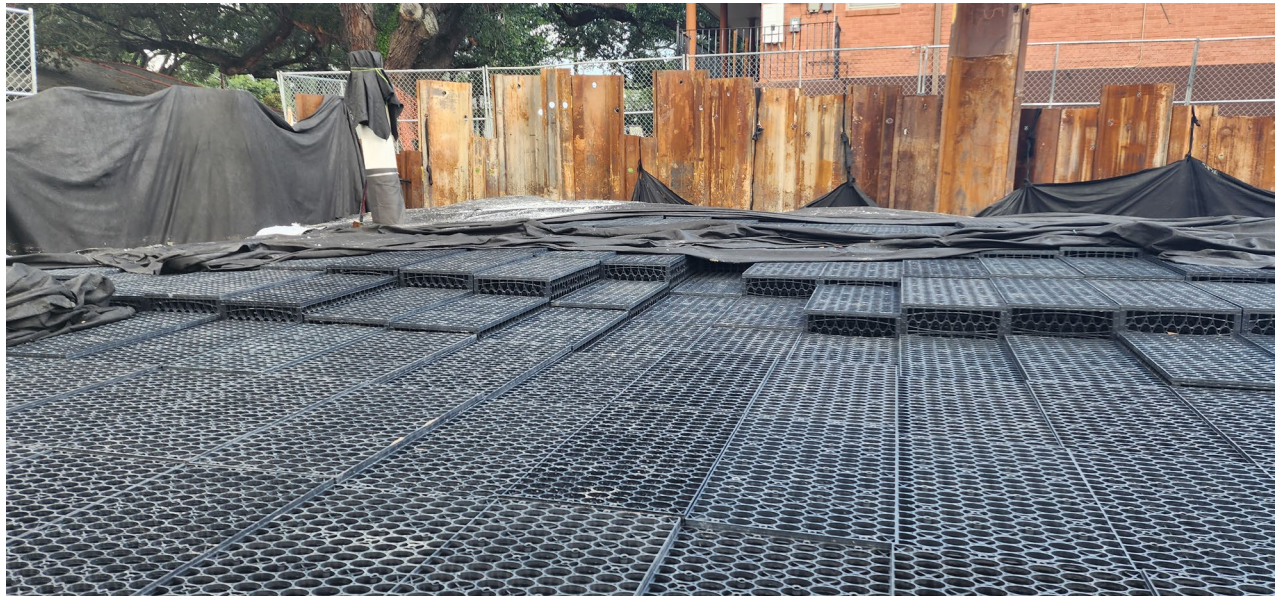
- Proposed Subsurface System at Empty Lots along W. Harrison Ave.

- Flood reduction values:
  - Max. WSE Decrease of 1.45’
  - Average WSE Decrease 0.15’

- Cost estimate: $6,744,685.54

- **NOTE : City would need to acquire vacant lots**



Proposed Alt. No. 5 – Flood Risk Reduction

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Proposed Alt. No. 5- Line Item Cost Estimate

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CNO West End H&H Study
Engineer's Opinion of Probable Construction Cost
Alternative No. 5: Proposed Installation of Modular Subsurface Retention Systems on W Harrison Ave.

ITEM NO.	ITEM OF WORK	UNIT	QUANTITY	UNIT PRICE	ESTIMATED TOTAL PRICE
1	Mobilization and Demobilization	LS	1.00	$170,000.00	$170,000.00
2	Sediment Erosion Control	LS	1.00	$5,000.00	$5,000.00
3	Tree Trimming	LS	1.00	$20,000.00	$20,000.00
4	Root Pruning	EACH	4.00	$1,500.00	$6,000.00
5	Removal of Existing Tree	EACH	2.00	$7,000.00	$14,000.00
6	Removal and Disposal of Existing Pavements (Portland Cement Concrete Pavement, Asphaltic Concrete Pavement, Composite Pavement)	SY	745.00	$24.00	$17,880.00
7	Roadway Excavation	CY	232.00	$52.00	$12,064.00
8	Superpave Asphaltic Concrete (2.5" Thick)	SY	356.00	$35.00	$12,460.00
9	Asphaltic Binder (4.5" Thick)	SY	356.00	$58.00	$20,648.00
10	Reinforced Concrete Pavement (8" Thick)	SY	390.00	$150.00	$58,500.00
11	Removal and Disposal of Existing Sidewalk, Driveway, Foot Lap (Concrete, Brick, Asphalt, etc.)	SY	16.00	$30.00	$480.00
12	Concrete Sidewalk (4" Thick)	SY	12.00	$92.00	$1,104.00
13	Concrete Driveway (6" Thick)	SY	4.00	$112.00	$448.00
14	Removal of Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections Including Saw Cutting	SY	100.00	$60.00	$6,000.00
15	Handicap Ramps, Curb and Gutter, and Concrete Sidewalks at Intersections	SY	100.00	$250.00	$25,000.00
16	Surface Applied Tactile / Detectable Warning Surface Tiles	SF	96.00	$60.00	$5,760.00
17	Removal and Disposal of Existing Curb and/or Gutter (Concrete, Asphalt, Brick, etc.)	LF	320.00	$9.00	$2,880.00
18	Furnish and Install Concrete Curb and/or Gutter	LF	320.00	$30.00	$9,600.00
19	Batture Sand for Dressing, Granular Material for other Adjustments	CY	34.00	$20.00	$680.00
20	Geotextile Fabric for Stabilization	SY	968.00	$2.50	$2,420.00
21	Geogrid	SY	894.00	$3.50	$3,129.00
22	Base Course	CY	199.00	$105.00	$20,895.00
23	Reinforced Conrete Pipe (18", Class III, Solid)	LF	82.00	$340.00	$27,880.00
24	Reinforced Concrete Pipe (42", Class III, Solid)	LF	328.00	$510.00	$167,280.00
25	8" Waterline Offset Up to 24"	EACH	1.00	$9,800.00	$9,800.00
26	No. 1 Standard Drain Manhole	FH	32.00	$750.00	$24,000.00
27	Subsurface Stormwater Storage - W. Harrison Ave. Lots[2]	CF	200,400.00	$12.00	$2,404,800.00
28	Subsurface Stormwater Storage Control Structure	EACH	2.00	$20,000.00	$40,000.00
29	Inline Check Valve (18")	EACH	2.00	$10,000.00	$20,000.00
30	Removal and Disposal of Excavated Material (Net Section)	CY	18,615.03	$20.00	$372,300.62
31	Hydroseeding	SF	62,826.00	$0.20	$12,565.20
32	Construction Layout	LS	1.00	$10,000.00	$10,000.00
33	Pre-construction Video	LS	1.00	$10,000.00	$10,000.00
34	Temporary Signs and Barricades	LS	1.00	$7,000.00	$7,000.00
				SUBTOTAL	**$3,520,573.82**
				CONTIGENCY (30%)	**$1,056,172.15**
				TOTAL ESTIMATED CONSTRUCTION COST	**$4,576,745.97**
				PROJECT DELIVERY COST[3]	**$2,167,939.57**
				PROJECT GRAND TOTAL	**$6,744,685.54**

Notes:

1. Quantities were developed at a 10% Conceptual level of effort and were developed with Conceptual Plan Sheets of the project alternative concept. Unit price values are estimated during the year 2024. These unit price values may increase over time.

2. Subsurface Stormwater Storage includes all labor, materials, and equipment required to excavate, furnish, and install modular subsurface retention system. Cost excludes the hauling away of spoils from excavation.

3. Project delivery includes basic Professional Engineering Services and Permitting, Surveying, Geotechnical Investigation, Construction Admin., Resident Inspection, and Materials Testing. Project Delivery also includes $1,630,200.00 for acquisition of property to implement project alternative.

Project Cost:

- Construction: $4,576,745.97
- Soft Costs (Design): $2,167,939.57
- Total Project Cost: $6,744,658,54

(Includes $1.6 million in acquisition costs)

Percent Dollars of:

Infrastructure Upgrades: 13%

GI Investment: 87%

Proposed Alt. No. 6 -Overview Map

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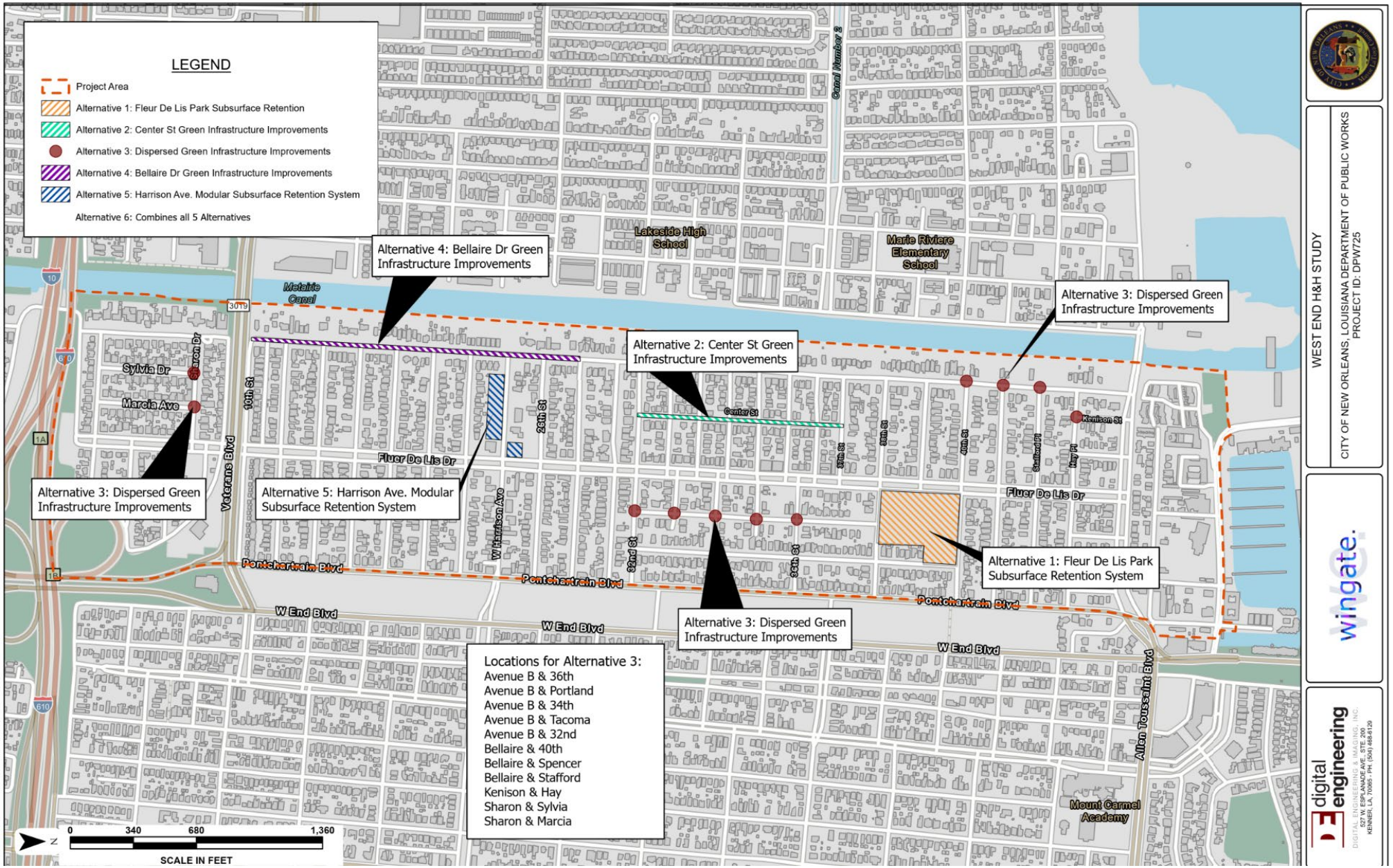

Alt. No. 6- Overview Cost Estimate

Resilience + Sustainability
CITY OF NEW ORLEANS

CNO West End H&H Study Engineer's Opinion of Probable Construction Cost		
ITEM NO.	DESCRIPTION	ESTIMATED CONSTRUCTION COST
1	Alternative No. 1: Proposed Installation of Modular Subsurface Retention Systems at Fleur de Lis Park	$10,160,547.15
2	Alternative No. 2: Proposed Installation of Infiltration Trenches on Center St. (Between 32nd & 37th St.)	$7,748,846.95
3	Alternative No. 3: Proposed Installation of Intersection Bulb-Outs in West End Neighborhood (11 Total Intersections)	$11,365,480.10
4	Alternative No. 4: Proposed Installation of Bioretention Cells on Bellaire Dr. (Between 10th & 28th St.)	$13,355,290.79
5	Alternative No. 5: Proposed Installation of Modular Subsurface Retention Systems on W Harrison Ave.	$4,576,745.97
	TOTAL ESTIMATED CONSTRUCTION COST	**$47,206,910.96**
	PROJECT DELIVERY COST	**$5,776,759.40**
	PROJECT GRAND TOTAL	**$52,983,670.37**

- Combination of all Alternatives:

- Flood reduction values:
  - Max. WSE Decrease of 1.64’
  - Average WSE Decrease 0.45’

Total Project Cost: $52,983,670.37

Percent Dollars of:

- Infrastructure Upgrades: (49%)
- GI Investment: (51%)

Proposed Alt. No. 6 – Flood Risk Reduction

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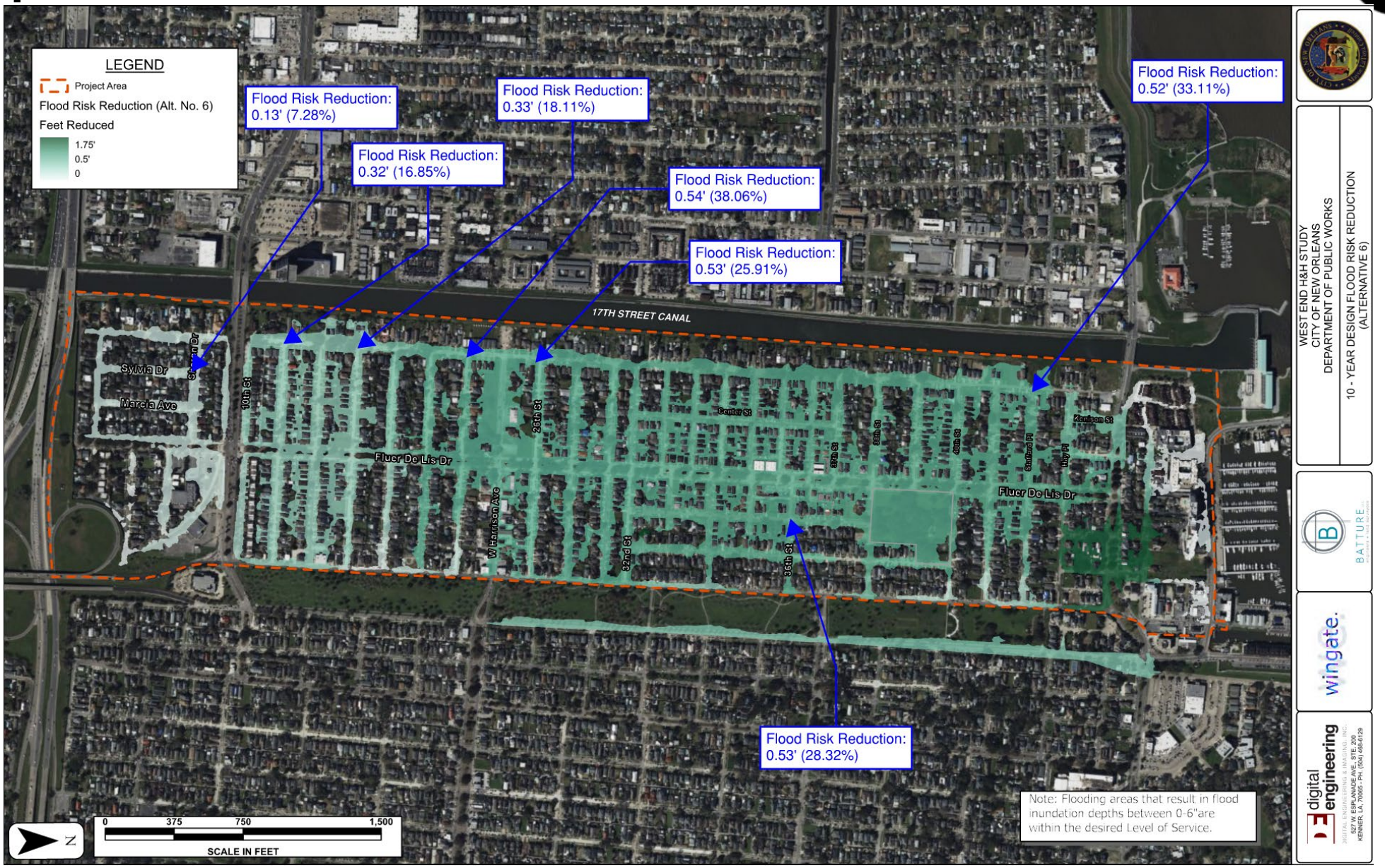

Project Alternatives Analysis Matrix

Resilience + Sustainability
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Scoring Criteria	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Reduce Flood Risk	✓✓				✓✓	✓✓
Risk Reduction: Increase Storage Capacity	✓✓✓	✓	✓	✓	✓✓	✓✓✓
Risk Reduction: Incorporate New Green Spaces		✓	✓	✓		✓
Reduce Urban Heat Impact	✓	✓	✓	✓	✓	✓
Civil Infrastructure Upgrades		✓	✓	✓		✓
Recreational & Community Opportunities	✓					✓
Implementation Measure: Cost	$11,096,030.52	$8,603,439.49	$12,576,543.61	$14,761,317.58	$6,744,685.54	$52,983,670.37
Implementation Measure: Schedule	24 months	24 months	24 months	24 months	36 months	48 months
Beautification to Public Spaces	✓		✓	✓	✓	✓