Essex Hudson Greenway Bridges Estimate

AACE Level 5 Estimate

August 27th, 2020

Prepared by:-

ARUP

77 Water Street

Floor 4

New York, NY

10005

AACE Estimate Classification Matrix

Estimate Level	Estimate Description	Design Phase	Level of Completion	Methodology	Accuracy Range
5	Rough Order of Magnitude	Planning Schematic Design	0% to 5%	Parametric Models Capacity Factored Historical Costs	L: -20% to - 50% H: +30% to +100%
4	Concept Feasibility	Planning Schematic Design	1% to 15%	Equipment Factored Parametric Models	L: -15% to - 30% H: +20% to +50%
3	Budget Authorization	Planning Schematic Design Design Documents	10% to 40%	Unit Costs Assembles	L: -10% to - 20% H: +10% to +40%
2	Budget Control Estimate	Preliminary Design Engineering Design Documents Construction Documents	30% to 70%	Detailed Unit Cost Detailed Take-Off	L: -5% to - 15% H: +5% to +30%
1	Bid	Detailed Design Engineering Construction Documents	50% to 100%	Detailed Unit Cost Detailed Take-Off Productivities Subcontractor Quotes	L: -2% to - 5% H: +3% to + 15%

1 Basis of Pricing

The cost estimate is classified as a Class 5 budget authorization estimate according to Arup's estimate classification matrix (Level 5), which was developed from the Association for the Advancement of Cost Engineering (AACE) best practices. The accuracy range of this estimate has been determined to be +30%/-30% and is indicative of likely bid prices if the project was issued to tender at this current stage.

Pricing shown reflects probable construction costs obtainable for the infrastructure works on the date of this statement of probable costs. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors, that is to mean 4 to 5 bids. If fewer bids are received, bid results can be expected to be higher.

This document is based on the measurement and pricing of quantities, wherever information is provided and/or reasonable assumptions for other works not covered in the drawings and programs as stated in this document. The unit rates reflected herein have been developed from project experience and industry research.

2 Scope of the Project

The scope of this cost estimate includes for the followings works:
- Contractor mobilization, construction of temporary facilities and laydown areas
- Demolition, Rehabilitation, and Replacement scopes of work for the 15 bridges outlined by Arup
- Contractor demobilization and site clean up

3 Documentations

The following documents and sources were used to develop the estimate of the Essex Hudson Greenway:
1. Structural Report by NAIK
2. Table of Bridges (WIP 28July20 rev0).xlsx
3. Google Earth

4 Project Construction Schedule

A project construction schedule was not part of the scope of work presented.

5 Contractors Indirect

Contractor's Indirect includes costs for general conditions, mobilization, site supervision, insurance, bonds, and other temporary works not included in the direct costs.

5 Contractors Overhead and Profit

Contractor's overhead and profit is reflective of the General Contractor's office overhead and profit.

6 Additional Contractor Cost Add-ons

Contractor Contingency of 25% has been included. This does not include additional items of scope, but rather design development of existing scope.
Five years of escalation has been included at 2.83%pa amounting to 15% as is included in the Essex Hudson Greenway Conceptual Cost Estimate prepared by Gardiner and Theobald on July 29th, 2020

7 Soft Costs

Soft costs have been included for this estimate under the following line items:
Planning and preliminary engineering design (3%)
Final engineering design (7%)
Site investigations surveying, inspections, testing, etc. (2%)
Project and construction management (5%)
Legal, permits, agency reviews (3%)

8 Assumptions

Capital Cost

Timber piles for Penhorn Creek assumed to be 25ft long
Assuming 2500 kg/m3 (.o78034 Tons/lb3) density of ballast based on AS 1141.6 and a 10% compaction
Assuming four girders length long, total replacement, 8"x12" for Penhorn Creek
Assuming penetrating concrete sealer for concrete bridges
Assume 8" thick for precast concrete panels on top of bridge
Assume 6" thick for poured concrete on top of bridge
Assuming Railing is 48" bicycle/pedestrian railing and fencing
Assumed a piece of furniture for every 250 sqft
For Concrete rehabilitation, it was assumed 1" of concrete needed for repair over the calculated sqft
An average labor rate of $150 was used to represent the average of all trades working on the project.
An average equipment rate of $30 was used to represent the average of all equipment used on the project. If there was a substantial equipment need for an activity, the hourly equipment rate was adjusted accordingly.
Assumed geomembrane is the same cost as sheet waterproofing.
Assumed graffiti removal was done one 10% of the sf of the structures
Assumed concrete jacket for Hackensack option 1 extends for height of 30ft and is built with tremie concrete construction methods
Assumed power cable installed underwater under navigation channel rests on top of river bed

Life Cycle Cost

The discount rate was estimated to be 4% from analyzing recent bond rates from the NJ Transportation Trust Fund Authority (https://www.state.nj.us/ttfa/financing/bonds.shtm)
Bridge operators cost assumed to be 5 people at 90k/year each
Assumed maintenance costs for mechanical equipment of the swing bridge was assumed to be 40 hours per month plus 10,000 in materials per month
An allowance for annual repairs of the bridge include costs for expansion joints, bearings, drainage, inspections, etc.
The annual allowance for alternative 1 bridge was estimated to be $150k a year because of the older steel material stock of the bridge, alternative 2 bridge was estimated at $50k due to new material stock and a larger composition of concrete, and alternative 3 was estimated at $200k because of the new material stock, larger bridge footprint, and a larger composition of concrete.
$5k a month was allocated for misc. repairs of the swing bridge options
$10k a month was allocated for misc. repairs of the swing bridge options due to larger bridge area
It was assumed the mechanical equipment would have to be repaired every 25 years
It was assumed that special maintenance and rehab costs would occur every 20 years at 5% of the project price of the Alternative 1 and 3% of the project price of Alternative 2 and 3

9 Items excluded from the Cost Estimate

Facilitating with the Croxton Intermodal Terminal Not Included.
Owner's Contingency and a risk based assessment of project risks, unknowns, and schedule impacts. A thorough risk assessment and statistical analysis to develop an Owner's Contractor Contingency and confidence level should be developed for a more insightful Contractor Contingency value.
The Owner's facilities onsite
Owner's direct management costs, running, and maintenance costs
Planning and enquiry costs, including legal expenses and fees
Site investigation
Land acquisition costs
Tests and inspections performed by others, apart from that listed in the estimate
Compensatory costs to other interested parties
Protection or relocation of existing utilities (unless stated)
Hazardous or contaminated mitigation (unless stated)
Agency engineering, management and administrative costs
No allowance has been included for construction managers / programs managers / project managers overseeing the work's completion.
Quality Assurance to be carried out by the Owner
Discovery of archaeological artifacts and their consequential effect on the project
Local taxes and duties
No interim repairs, stabilization, or safety measures are included from now until rehabilitation.

10 Items that may affect the cost estimate

Modifications to the scope of work included in this estimate
Special phasing requirements (unless stated)
Restrictive technical specifications or excessive contract conditions
Any other non-competitive bid situations
Bids delayed beyond the projected schedule

11 Statements of Probable Cost

Arup has no control over the cost of labor and materials, general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This opinion of probable cost of construction is made on the basis of the experience, qualifications, and best judgment of the professional consultant familiar with the construction industry. Arup cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent cost estimates.

12 Recommendation for Cost Control

Arup recommends that the Owner carefully review this document, including line item descriptions, unit prices, clarifications, exclusions, inclusions and assumptions, contingencies, escalation and markups. If the project is over budget, or if there are unresolved budgeting issues, alternate system schemes should be evaluated before proceeding into the construction phase.

13 Request for Modifications

Requests for modifications of any apparent errors or omissions to this document must be made to Arup within thirty (30) days of receipt of this estimate. Otherwise, it will be understood that the content has been concurred with and accepted by the Owner.

Hackensack Option Summary

Date August 27th, 2020

Alternative 1: Full Rehabilitation

This option includes complete rehabilitation of the existing bridge, both approach spans and center truss span. The approach spans substructure will be rehabilitated such that the approach spans are raised by 3ft to raise the girders above the flood level, taking into account sea level rise. The center truss will be returned to operable condition, including all new mechanical equipment for the movable swing span

Alternative 2: Replacement Movable Bridge

This option includes complete demolition of the existing bridge and replacement with a new low level movable bridge. The approach spans are constructed from precast concrete elements to increase durability in comparison with the existing steel structure. The navigation span will be a lightweight pedestrian truss swing span.

Alternative 3: Replacement High-Level Bridge

This option includes complete demolition of the existing bridge and replacement with a new high-level fixed bridge that spans the navigation channel, providing 50ft required navigation clearance. The bridge will be constructed with steel girder approach spans and a long span pedestrian truss over the navigation channel. The bridge will be approximately 2260ft in length in order to climb to the required elevation over the navigation channel at the maximum 5% grade.

Essex Hudson Greenway

Date August 27th, 2020

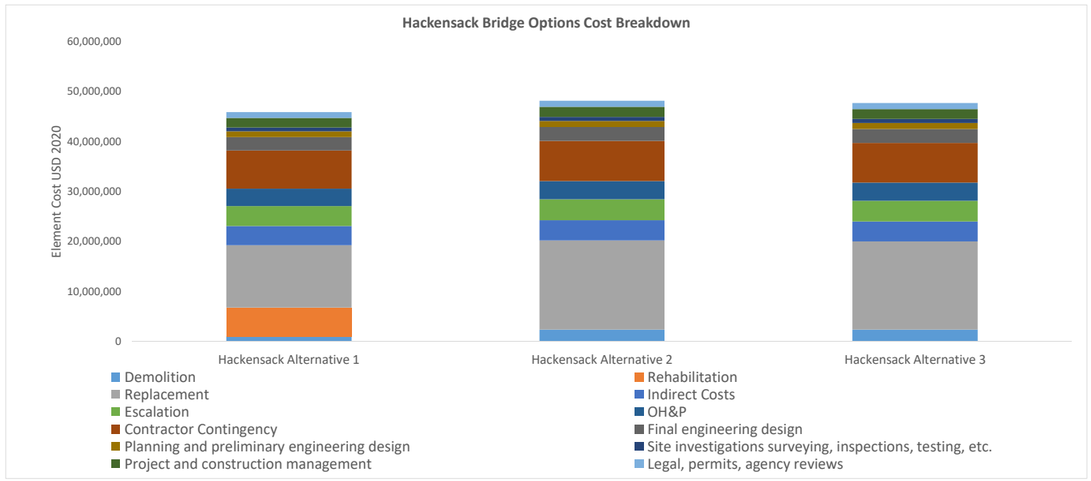
Bridge of Interest
Probable Option

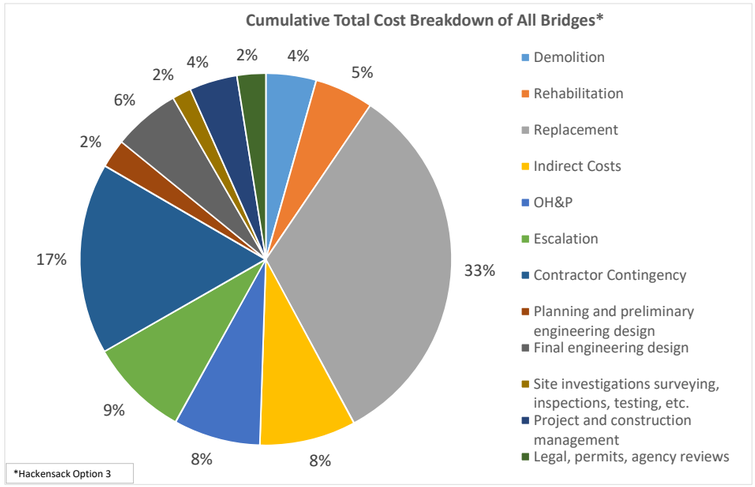
Summary Table

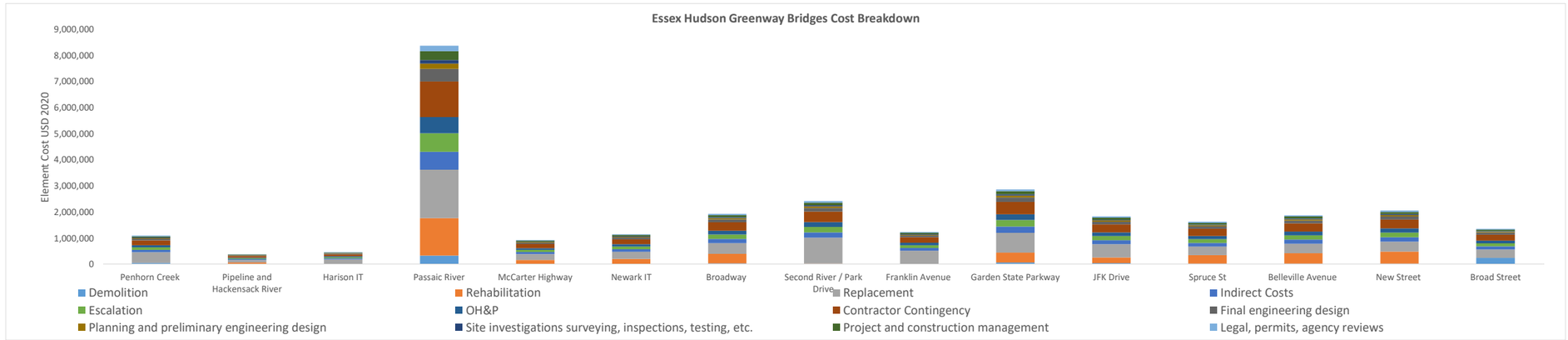
*Note total is based off of High-Level Bridge Option

	Penhorn Creek	Hackensack Alternative 1	Hackensack Alternative 2	Hackensack Alternative 3	Pipeline and Hackensack River	Harison IT	Passaic River	McCarter Highway	Newark IT	Broadway	Second River / Park Drive	Franklin Avenue	Garden State Parkway	JFK Drive	Spruce St	Belleville Avenue	New Street	Broad Street	Total
Demolition	$ 52,253	$ 1,058,400	$ 2,417,600	$ 2,417,600	$ 8,424	$ 4,571	$ 334,560	$ 18,216	$ 23,460	$ 34,500	$ 24,954	$ 10,861	$ 71,369	$ 48,840	$ 26,880	$ 30,000	$ 30,360	$ 245,760	$ 3,382,609
Rehabilitation	$ -	$ 5,751,010	$ -	$ -	$ 57,954	$ 208	$ 1,434,894	$ 146,460	$ 184,650	$ 361,800	$ 3,403	$ 1,481	$ 373,722	$ 210,586	$ 326,016	$ 396,462	$ 455,437	$ -	$ 3,953,073
Replacement	$ 409,458	$ 12,438,752	$ 17,787,318	$ 17,596,658	$ 96,173	$ 189,468	$ 1,849,319	$ 226,776	$ 274,866	$ 415,509	$ 988,427	$ 508,302	$ 759,886	$ 509,625	$ 331,331	$ 362,092	$ 378,268	$ 326,067	$ 25,222,224
Total Direct Cost	$ 461,711	$ 19,248,162	$ 20,204,918	$ 20,014,258	$ 162,551	$ 194,246	$ 3,618,773	$ 391,452	$ 482,976	$ 811,809	$ 1,016,784	$ 520,644	$ 1,204,976	$ 769,051	$ 684,227	$ 788,554	$ 864,065	$ 571,827	$ 32,557,905
Indirect Costs	$ 92,342	$ 3,849,632	$ 4,040,984	$ 4,002,852	$ 32,510	$ 38,849	$ 687,755	$ 78,290	$ 96,595	$ 162,362	$ 203,357	$ 104,129	$ 240,995	$ 153,810	$ 136,845	$ 157,711	$ 172,813	$ 114,365	$ 6,475,581
Total Construction Cost	$ 554,053	$ 23,097,794	$ 24,245,901	$ 24,017,109	$ 195,061	$ 233,096	$ 4,306,528	$ 469,743	$ 579,571	$ 974,170	$ 1,220,141	$ 624,773	$ 1,445,972	$ 922,861	$ 821,072	$ 946,265	$ 1,036,878	$ 686,192	$ 39,033,486
OH&P	$ 83,108	$ 3,464,669	$ 3,636,885	$ 3,602,566	$ 29,259	$ 34,964	$ 618,979	$ 70,461	$ 86,936	$ 146,126	$ 183,021	$ 93,716	$ 216,896	$ 138,429	$ 123,161	$ 141,940	$ 155,532	$ 102,929	$ 5,828,023
Escalation	$ 95,574	$ 3,984,370	$ 4,182,418	$ 4,142,951	$ 33,648	$ 40,209	$ 711,826	$ 81,031	$ 99,976	$ 168,044	$ 210,474	$ 107,773	$ 249,430	$ 159,193	$ 141,635	$ 163,231	$ 178,862	$ 118,368	$ 6,702,226
Contractor Contingency	$ 183,184	$ 7,636,708	$ 8,016,301	$ 7,940,657	$ 64,492	$ 77,067	$ 1,364,333	$ 155,309	$ 191,621	$ 322,085	$ 403,409	$ 206,566	$ 478,074	$ 305,121	$ 271,467	$ 312,859	$ 342,818	$ 226,872	$ 12,845,934
Total Construction Price	$ 915,920	$ 38,183,541	$ 40,081,506	$ 39,703,284	$ 322,461	$ 385,336	$ 7,001,666	$ 776,543	$ 958,104	$ 1,610,425	$ 2,017,045	$ 1,032,828	$ 2,390,372	$ 1,525,604	$ 1,357,335	$ 1,564,295	$ 1,714,089	$ 1,134,361	$ 64,409,669
Planning and preliminary engineering design	$ 27,478	$ 1,145,506	$ 1,202,445	$ 1,191,099	$ 9,674	$ 11,560	$ 204,650	$ 23,296	$ 28,743	$ 48,313	$ 60,511	$ 30,985	$ 71,711	$ 45,768	$ 40,720	$ 46,929	$ 51,423	$ 34,031	$ 1,926,890
Final engineering design	$ 64,114	$ 2,672,848	$ 2,805,705	$ 2,779,230	$ 22,572	$ 26,974	$ 477,517	$ 54,358	$ 67,067	$ 112,730	$ 141,193	$ 72,298	$ 167,326	$ 106,792	$ 95,013	$ 109,501	$ 119,986	$ 79,405	$ 4,496,077
Site investigations surveying, inspections, testing, etc.	$ 18,318	$ 763,671	$ 801,630	$ 794,066	$ 6,449	$ 7,707	$ 136,433	$ 15,531	$ 19,162	$ 32,209	$ 40,341	$ 20,657	$ 47,807	$ 30,512	$ 27,147	$ 31,286	$ 34,282	$ 22,687	$ 1,284,593
Project and construction management	$ 45,796	$ 1,909,177	$ 2,004,075	$ 1,985,164	$ 16,123	$ 19,267	$ 341,083	$ 38,827	$ 47,905	$ 80,521	$ 100,852	$ 51,641	$ 119,519	$ 76,280	$ 67,867	$ 78,215	$ 85,704	$ 56,718	$ 3,211,483
Legal, permits, agency reviews	$ 27,478	$ 1,145,506	$ 1,202,445	$ 1,191,099	$ 9,674	$ 11,560	$ 204,650	$ 23,296	$ 28,743	$ 48,313	$ 60,511	$ 30,985	$ 71,711	$ 45,768	$ 40,720	$ 46,929	$ 51,423	$ 34,031	$ 1,926,890
Total Project Price	$ 1,099,103	$ 45,820,250	$ 48,097,807	$ 47,643,940	$ 386,953	$ 462,404	$ 8,366,000	$ 931,852	$ 1,149,725	$ 1,932,510	$ 2,420,454	$ 1,239,394	$ 2,868,446	$ 1,830,725	$ 1,628,802	$ 1,877,153	$ 2,056,907	$ 1,361,234	$ 77,255,603
High (30%)	$ 1,428,834	$ 59,566,325	$ 62,527,149	$ 61,937,122	$ 503,039	$ 601,125	$ 10,875,799	$ 1,211,407	$ 1,494,642	$ 2,512,263	$ 3,146,590	$ 1,611,212	$ 3,728,980	$ 2,379,943	$ 2,117,443	$ 2,440,299	$ 2,673,980	$ 1,769,604	$ 100,432,284
Likely	$ 1,099,103	$ 45,820,250	$ 48,097,807	$ 47,643,940	$ 386,953	$ 462,404	$ 8,366,000	$ 931,852	$ 1,149,725	$ 1,932,510	$ 2,420,454	$ 1,239,394	$ 2,868,446	$ 1,830,725	$ 1,628,802	$ 1,877,153	$ 2,056,907	$ 1,361,234	$ 77,255,603
Low (-30%)	$ 769,372	$ 32,074,175	$ 33,668,465	$ 33,350,758	$ 309,562	$ 369,923	$ 6,692,800	$ 745,481	$ 919,780	$ 1,546,008	$ 1,936,363	$ 991,515	$ 2,294,757	$ 1,464,580	$ 1,303,042	$ 1,501,723	$ 1,645,526	$ 1,088,987	$ 56,930,178

Summary Graphs







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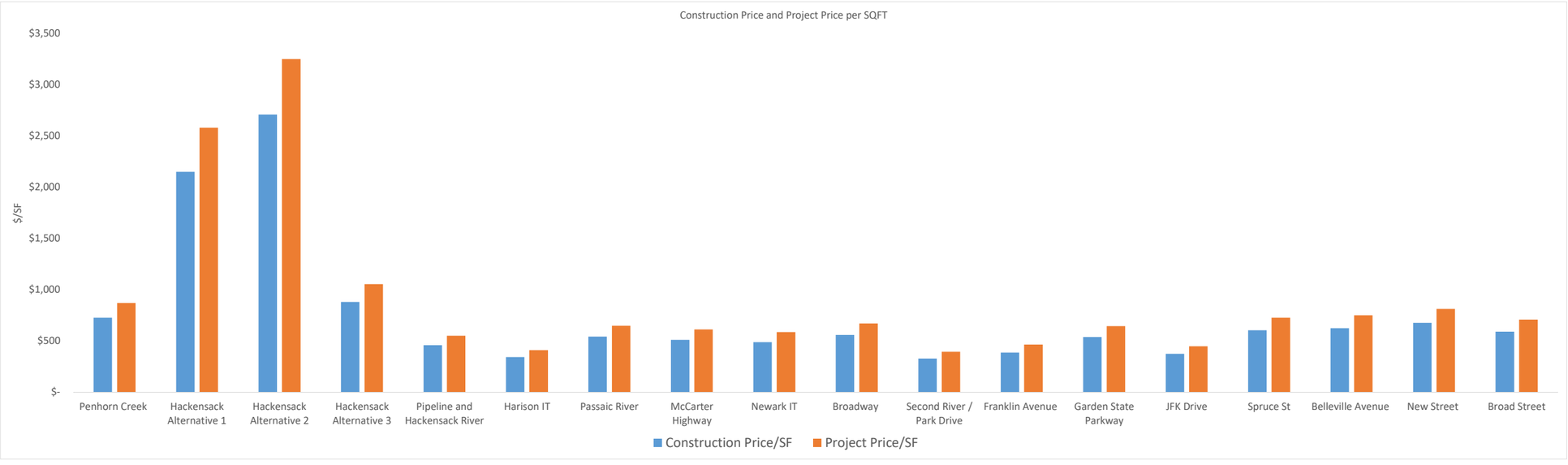
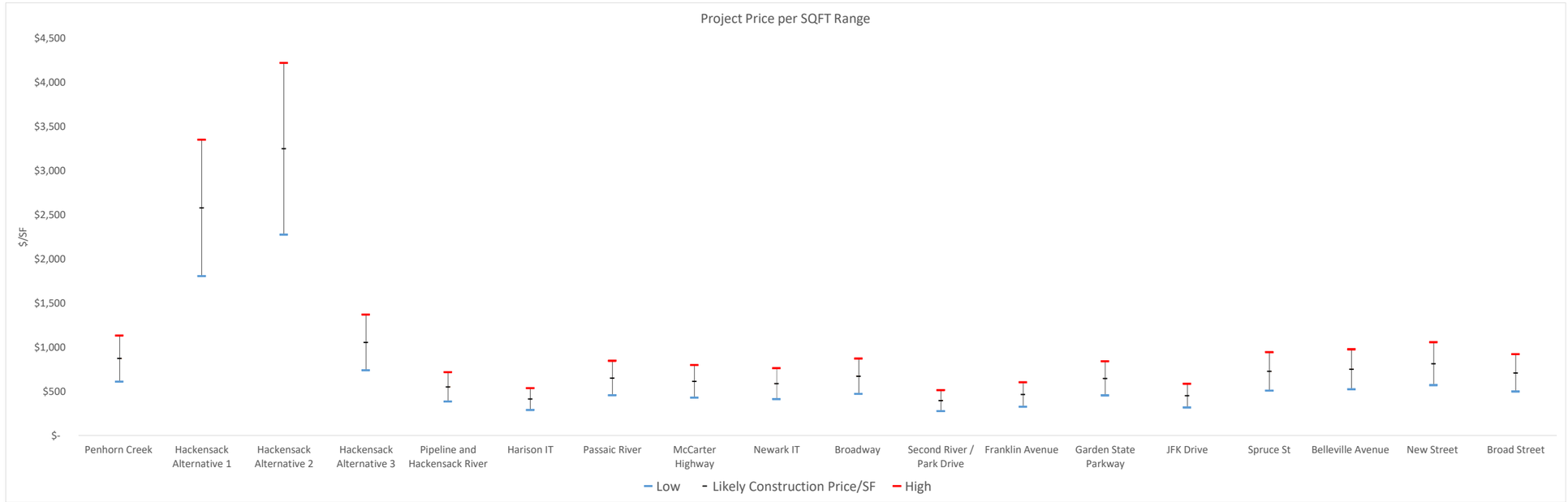
$/SF

	Penhorn Creek	Hackensack Alternative 1	Hackensack Alternative 2	Hackensack Alternative 3	Pipeline and Hackensack River	Harison IT	Passaic River	McCarter Highway	Newark IT	Broadway	Second River / Park Drive	Franklin Avenue	Garden State Parkway	JFK Drive	Spruce St	Belleville Avenue	New Street	Broad Street	Total
Area of Bridge	1,260	17,760	14,800	45,200	702	1,122	12,880	1,518	1,955	2,875	6,125	2,666	4,440	4,070	2,240	2,500	2,530	1,920	94,003
Low	$ 509	$ 1,505	$ 1,896	$ 615	$ 322	$ 240	$ 381	$ 358	$ 343	$ 392	$ 231	$ 271	$ 377	$ 262	$ 424	$ 438	$ 474	$ 414	$ 480
Construction Price/SF	$ 727	$ 2,150	$ 2,708	$ 878	$ 459	$ 343	$ 544	$ 512	$ 490	$ 560	$ 329	$ 387	$ 538	$ 375	$ 606	$ 626	$ 678	$ 591	$ 685
High	$ 945	$ 2,795	$ 3,521	$ 1,142	$ 597	$ 446	$ 707	$ 665	$ 637	$ 728	$ 428	$ 504	$ 700	$ 487	$ 788	$ 813	$ 881	$ 768	$ 891
Low	$ 611	$ 1,806	$ 2,275	$ 738	$ 386	$ 288	$ 455	$ 430	$ 412	$ 471	$ 277	$ 325	$ 452	$ 315	$ 509	$ 526	$ 569	$ 496	$ 575
Project Price/SF	$ 872	$ 2,580	$ 3,250	$ 1,054	$ 551	$ 412	$ 650	$ 614	$ 588	$ 672	$ 395	$ 465	$ 646	$ 450	$ 727	$ 751	$ 813	$ 709	$ 822
High	$ 1,134	$ 3,354	$ 4,225	$ 1,370	$ 717	$ 536	$ 844	$ 798	$ 765	$ 874	$ 514	$ 604	$ 840	$ 585	$ 945	$ 976	$ 1,057	$ 922	$ 1,068





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Essex Hudson Greenway

Date August 27th, 2020

Bridge: Penhorn Creek

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 52,253
1.1.0		Substructure					$ 32,000
1.1.1			Timber piles	10	EA	$ 3,200	$ 32,000
1.2.0		Deck					$ 20,253
1.2.1			Timber deck	1260	SF	$ 12	$ 15,120
1.2.2			Remove existing stone ballast	93.3	CY	$ 40	$ 3,733
1.2.3			Disposal cost of ballast	93.3	CY	$ 15	$ 1,400
1.3.0		Special Circumstances					$ -
1.3.1			Existing Operation of Train				$ -
2.0.0	Rehabilitation						$ -
3.0.0	Replacement						$ 409,458
3.1.0		Substructure					$ 95,000
3.1.1			Timber or Concrete Piles	10	EA	$ 9,500	$ 95,000
3.2.0		Super Structure					$ 14,514
3.2.1			Install new timber girders	168	LF	$ 86	$ 14,514
3.3.0		Deck					$ 244,476
3.3.1			Install Timber deck	1260	SF	$ 91	$ 114,200
3.3.2			Install sheet waterproofing on deck	1260	SF	$ 43	$ 54,004
3.3.3			Install 2ft new stone aggregate base	216.31	Tons	$ 55	$ 11,897
3.3.4			Concrete pavement	23.3	CY	$ 1,200	$ 28,000
3.3.5			Install railing	164	LF	$ 192	$ 31,419
3.3.6			Install drainage	42	LF	$ 118	$ 4,956
3.4.0		Finishes					$ 55,468
3.4.1			General clean up/ Graffiti removal	126	SF	$ 18	$ 2,268
3.4.2			Install lighting	7	EA	$ 7,600	$ 53,200
4.0.0	Total Direct Cost						$ 461,711
4.0.1			Indirect Costs	20%			$ 92,342
5.0.0	Total Construction Cost						$ 554,053
5.0.1			OH & P	15%			$ 83,108
5.0.2			Escalation	15%			$ 95,574
5.0.3			Contractor Contingency	25%			$ 183,184
6.0.0	Total Construction Price						$ 915,920
6.0.1			Planning and preliminary engineering design	3%			$ 27,478
6.0.2			Final engineering design	7%			$ 64,114
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 18,318
6.0.4			Project and construction management	5%			$ 45,796
6.0.5			Legal, permits, agency reviews	3%			$ 27,478
7.0.0	Total Project Price						$ 1,099,103
7.0.1			*High*	30%			$ 1,428,834
7.0.2			Likely	0			$ 1,099,103
7.0.3			*Low*	-30%			$ 769,372

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Essex Hudson Greenway

Date August 27th, 2020

Bridge Hackensack Alternative 1: Full Rehabilitation

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 1,058,400.00
1.1.0		Approach Spans					$ 554,400
1.1.1			Remove timber guards	2	EA	$ 50,400	$ 100,800
1.1.2			Drop spans on barge and ship off site	6	EA	$ 75,600	$ 453,600
1.2.0		Spin Bridge					$ 504,000
1.2.1			Remove timber pier protection	1	EA	$ 252,000	$ 252,000
1.2.2			Lift truss on to barges and ship off site	1	EA	$ 252,000	$ 252,000
2.0.0	Rehabilitation						$ 5,751,010
2.1.0		Approach Substructure					$ 2,380,960
2.1.1			12" Reinforced concrete jacket Underwater Pour	500	CY	$ 1,500	$ 750,000
2.1.2			3' cap on existing piers - Above Water	120	CY	$ 1,000	$ 120,000
2.1.3			Structural steel rehab (Replace damaged steel with new)	78400	LBS	$ 3	$ 196,000
2.1.4			Blast clean and add 3-Coat (DOT TYPE) Steel Paint System	52800	SFT	$ 6	$ 316,800
2.1.5			Disc Bearings- Expansion	24	EA	$ 12,420	$ 298,080
2.1.6			Disc Bearings- Fixed	24	EA	$ 10,420	$ 250,080
2.1.7			Reinstall spans	6	EA	$ 75,000	$ 450,000
2.2.0		Center Truss Rehabilitation					$ 1,528,800
2.2.1			Structural steel rehab (Replace damaged steel with new)	23520	LBS	$ 3	$ 58,800
2.2.2			Blast clean and add 3-Coat (DOT TYPE) Steel Paint System	81250	SF	$ 6	$ 487,500
2.2.3			Structural steel raised platform	195000	LBS	$ 4	$ 682,500
2.2.4			Reinstall truss	1	EA	$ 300,000	$ 300,000
2.3.0		Pivot Pier					$ 1,841,250
2.3.1			Concrete rehabilitation	25	CY	$ 1,200	$ 30,000
2.3.2			Rebuild pier fender system (30ft Height) - Vertical Timber Piers	24150	SF	$ 75	$ 1,811,250
3.0.0	Replacement						$ 12,438,752
3.1.0		Bridge Mechanical Equipment					$ 11,400,000
3.1.1			Electric and power supply to pivot pier	800	LF	$ 500	$ 400,000
3.1.2			Rim bearing movable bridge drive systems (machinery and electrical equipment)	1	EA	$ 11,000,000	$ 11,000,000
3.2.0		Deck					$ 529,800
3.2.1			8" Precast deck panels	14800	SF	$ 25	$ 370,000
3.2.2			Drainage System	740	LF	$ 82	$ 60,680
3.2.3			Strip seal expansion joint	120	LF	$ 826	$ 99,120
3.3.0		Finishes					$ 508,952
3.3.1			Nighttime functional lighting	10	EA	$ 7,600	$ 76,000
3.3.2			Aesthetic Benches / Furniture	10	EA	$ 4,200	$ 42,000
3.3.3			18" Concrete curb	82.2	CY	$ 1,120	$ 92,089
3.3.4			42" Aesthetic Bicycle Railing	1560	LF	$ 192	$ 298,863
4.0.0	Total Direct Cost						$ 19,248,162
4.0.1			Indirect Costs	20%			$ 3,849,632
5.0.0	Total Construction Cost						$ 23,097,794
5.0.1			OH & P	15%			$ 3,464,669
5.0.2			Escalation	15%			$ 3,984,370
5.0.3			Contractor Contingency	25%			$ 7,636,708
6.0.0	Total Construction Price						$ 38,183,541
6.0.1			Planning and preliminary engineering design	3%			$ 1,145,506

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Bridge Hackensack Alternative 1: Full Rehabilitation

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
6.0.2			Final engineering design	7%			$ 2,672,848
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 763,671
6.0.4			Project and construction management	5%			$ 1,909,177
6.0.5			Legal, permits, agency reviews	3%			$ 1,145,506
7.0.0	Total Project Price						$ 45,820,250
7.0.1			*High*	30%			$ 59,566,325
7.0.2			Likely				$ 45,820,250
7.0.3			*Low*	-30%			$ 32,074,175

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Bridge Hackensack Alternative 2: Replacement Movable Bridge

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 2,417,600.00
1.1.0		Approach Spans					$ 1,511,200.00
1.1.1			Remove timber guards	2	EA	$ 50,400	$ 100,800
1.1.2			Drop spans on barge	6	EA	$ 75,600	$ 453,600
1.1.3			Remove pier table	6	EA	$ 25,200	$ 151,200
1.1.4			Remove piers to water level	6	EA	$ 25,200	$ 151,200
1.1.5			Pulverize piers	6	EA	$ 25,200	$ 151,200
1.1.6			Remove concrete from river bottom	6	EA	$ 25,200	$ 151,200
1.1.7			Remove abutment	2	EA	$ 126,000	$ 252,000
1.1.8			Disposal	1	LS	$ 100,000	$ 100,000
1.2.0		Spin Bridge					$ 906,400
1.2.1			Lift truss on to barges	1	EA	$ 252,000	$ 252,000
1.2.2			Remove timber pier protection	1	EA	$ 252,000	$ 252,000
1.2.3			Remove mechanical equipment	1	EA	$ 100,800	$ 100,800
1.2.4			Pulverize concrete pier	1	EA	$ 126,000	$ 126,000
1.2.5			Remove concrete from river bottom	1	EA	$ 75,600	$ 75,600
1.2.6			Disposal	1	EA	$ 100,000	$ 100,000
2.0.0	Rehabilitation						$ -
3.0.0	Replacement						$ 17,787,318
3.1.0		Approach Substructure					$ 199,500
3.1.1			24" Square precast concrete pile	170	CY	$ 600	$ 102,000
3.1.2			Hammerhead pier cap	50	CY	$ 800	$ 40,000
3.1.3			Abutment	60	CY	$ 750	$ 45,000
3.1.4			Embankment fill at each landing	250	CY	$ 50	$ 12,500
3.2.0		Approach Superstructure					$ 450,000
3.2.1			Prestressed concrete girders at approaches (3 girder lines per span)	300	CY	$ 1,500	$ 450,000
3.3.0		Navigation Span Substructure					$ 4,699,066
3.3.1			6ft diameter concrete infill	360	LF	$ 2,000	$ 720,000
3.3.2			6ft diameter 1/2" thick permanent steel casing	61600	LBS	$ 4	$ 215,600
3.3.3			Pivot Pier	233	CY	$ 1,500	$ 349,066
3.3.4			Ship impact protection fender system	1	EA	$ 1,000,000	$ 1,000,000
3.3.5			Steel Truss Navigation Span	322400	LBS	$ 6	$ 1,934,400
3.3.6			Bearings (assume steel elastomeric reinforced)	24	EA	$ 20,000	$ 480,000
3.4.0		Bridge Mechanical Equipment					$ 11,400,000
3.4.1			Electric and power supply to pivot pier	800	LF	$ 500	$ 400,000
3.4.2			Rim bearing movable bridge drive systems	1	EA	$ 11,000,000	$ 11,000,000
3.5.0		Deck					$ 529,800
3.5.1			8" Precast deck panels	14800	SF	$ 25	$ 370,000
3.5.2			Drainage System	740	LF	$ 82	$ 60,680
3.5.3			Strip seal expansion joint	120	LF	$ 826	$ 99,120
3.6.0		Finishes					$ 508,952
3.6.1			Nighttime functional lighting	10	EA	$ 7,600	$ 76,000
3.6.2			Aesthetic Benches / Furniture	10	EA	$ 4,200	$ 42,000
3.6.3			18" Concrete curb	82.2	CY	$ 1,120	$ 92,089
3.6.4			42" Aesthetic Bicycle Railing	1560	LF	$ 192	$ 298,863

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Bridge Hackensack Alternative 2: Replacement Movable Bridge

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
4.0.0	Total Direct Cost						$ 20,204,918
4.0.1			Indirect Costs	20%			$ 4,040,984
5.0.0	Total Construction Cost						$ 24,245,901
5.0.1			OH & P	15%			$ 3,636,885
5.0.2			Escalation	15%			$ 4,182,418
5.0.3			Contractor Contingency	25%			$ 8,016,301
6.0.0	Total Construction Price						$ 40,081,506
6.0.1			Planning and preliminary engineering design	3%			$ 1,202,445
6.0.2			Final engineering design	7%			$ 2,805,705
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 801,630
6.0.4			Project and construction management	5%			$ 2,004,075
6.0.5			Legal, permits, agency reviews	3%			$ 1,202,445
7.0.0	Total Project Price						$ 48,097,807
7.0.1			*High*	30%			$ 62,527,149
7.0.2			Likely				$ 48,097,807
7.0.3			*Low*	-30%			$ 33,668,465

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Bridge Hackensack Alternative 3: Replacement High-Level Bridge

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 2,417,600.00
1.1.0		Approach Spans					$ 1,511,200.00
1.1.1			Remove timber guards	2	EA	$ 50,400	$ 100,800
1.1.2			Drop spans on barge	6	EA	$ 75,600	$ 453,600
1.1.3			Remove pier table	6	EA	$ 25,200	$ 151,200
1.1.4			Remove piers to water level	6	EA	$ 25,200	$ 151,200
1.1.5			Pulverize piers	6	EA	$ 25,200	$ 151,200
1.1.6			Remove concrete from river bottom	6	EA	$ 25,200	$ 151,200
1.1.7			Remove abutment	2	EA	$ 126,000	$ 252,000
1.1.8			Disposal	1	LS	$ 100,000	$ 100,000
1.2.0		Approach Spans					$ 906,400
1.2.1			Lift truss on to barges	1	EA	$ 252,000	$ 252,000
1.2.2			Remove timber pier protection	1	EA	$ 252,000	$ 252,000
1.2.3			Remove mechanical equipment	1	EA	$ 100,800	$ 100,800
1.2.4			Pulverize concrete pier	1	EA	$ 126,000	$ 126,000
1.2.5			Remove concrete from river bottom	1	EA	$ 75,600	$ 75,600
1.2.6			Disposal	1	EA	$ 100,000	$ 100,000
2.0.0	Rehabilitation						$ -
3.0.0	Replacement						$ 17,596,658
3.1.0		Draft Shaft Foundations					$ 3,742,050
3.1.1			6ft diameter concrete infill	1440	LF	$ 2,000	$ 2,880,000
3.1.2			6ft diameter 1/2" thick permanent steel casing	246300	LBS	$ 4	$ 862,050
3.2.0		Superstructure					$ 9,366,600
3.2.1			Steel Girder Approaches (3 girder lines per span)	880000	LBS	$ 6	$ 5,280,000
3.2.2			Steel Truss Navigation Span	322400	LBS	$ 6	$ 1,934,400
3.2.3			Bearings (assume steel elastomeric reinforced)	72	EA	$ 20,000	$ 1,440,000
3.2.4			3-Coat (DOT TYPE) Steel Paint System	118700	SF	$ 6	$ 712,200
3.3.0		Substructure					$ 557,000
3.3.1			5ft diameter column	300	CY	$ 1,200	$ 360,000
3.3.2			Hammerhead pier cap	190	CY	$ 800	$ 152,000
3.3.3			Abutment	60	CY	$ 750	$ 45,000
3.4.0		Deck					$ 2,490,900
3.4.1			Permanent Metal Deck Forms	45200	SF	$ 25	$ 1,130,000
3.4.2			8" CIP Bridge Deck	45200	SF	$ 25	$ 1,130,000
3.4.3			Drainage System	2450	LF	$ 82	$ 200,900
3.4.4			Strip seal expansion joint	120	LF	$ 250	$ 30,000
3.5.0		Finishes					$ 1,440,108
3.5.1			Nighttime functional lighting	31	EA	$ 7,600	$ 235,600
3.5.2			Aesthetic Benches / Furniture	10	EA	$ 4,200	$ 42,000
3.5.3			18" CONCRETE CURB	251	CY	$ 1,120	$ 281,244
3.5.4			42" Aesthetic Bicycle Railing	4600	LF	$ 192	$ 881,263
4.0.0	Total Direct Cost						$ 20,014,258
4.0.1			Indirect Costs	20%			$ 4,002,852
5.0.0	Total Construction Cost						$ 24,017,109
5.0.1			OH & P	15%			$ 3,602,566

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Bridge Hackensack Alternative 3: Replacement High-Level Bridge

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
5.0.2			Escalation	15%			$ 4,142,951
5.0.3			Contractor Contingency	25%			$ 7,940,657
6.0.0	Total Construction Price						$ 39,703,284
6.0.1			Planning and preliminary engineering design	3%			$ 1,191,099
6.0.2			Final engineering design	7%			$ 2,779,230
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 794,066
6.0.4			Project and construction management	5%			$ 1,985,164
6.0.5			Legal, permits, agency reviews	3%			$ 1,191,099
7.0.0	Total Project Price						$ 47,643,940
7.0.1			*High*	30%			$ 61,937,122
7.0.2			Likely	0			$ 47,643,940
7.0.3			*Low*	-30%			$ 33,350,758

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Bridge Pipeline and Hackensack River

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 8,424
1.1.0		Deck					$ 8,424
1.1.1			Timber deck	702	SF	$ 12	$ 8,424
2.0.0	Rehabilitation						$ 57,954
2.1.0		Superstructure					$ 57,954
2.1.1			Repair girders	7.8	LF	$ 770	$ 6,006
2.1.2			Steel rehabilitation	70.2	SF	$ 740	$ 51,948
3.0.0	Replacement						$ 96,173
3.1.0		Deck					$ 45,906
3.1.1			Install precast concrete	702	SF	$ 25	$ 17,550
3.1.2			Install railing	132	LF	$ 192	$ 25,288
3.1.3			Install drainage	26	LF	$ 118	$ 3,068
3.2.0		Finishes					$ 50,267
3.2.1			General clean up/ Graffiti removal	70.2	SF	$ 18	$ 1,264
3.2.2			Install lighting	4	EA	$ 7,600	$ 30,400
3.2.3			Blast clean and repaint entire bridge	702	SF	$ 27	$ 18,603
4.0.0	Total Direct Cost						$ 162,551
4.0.1			Indirect Costs	20%			$ 32,510
5.0.0	Total Construction Cost						$ 195,061
5.0.1			OH & P	15%			$ 29,259
5.0.2			Escalation	15%			$ 33,648
5.0.3			Contractor Contingency	25%			$ 64,492
6.0.0	Total Construction Price						$ 322,461
6.0.1			Planning and preliminary engineering design	3%			$ 9,674
6.0.2			Final engineering design	7%			$ 22,572
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 6,449
6.0.4			Project and construction management	5%			$ 16,123
6.0.5			Legal, permits, agency reviews	3%			$ 9,674
7.0.0	Total Project Price						$ 386,953
7.0.1			*High*	30%			$ 503,039
7.0.2			Likely	0%			$ 386,953
7.0.3			*Low*	-30%			$ 270,867

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Bridge Harisson IT

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 4,571
1.1.0		Deck					$ 4,571
1.1.1			Remove existing stone ballast	83.111	CY	$ 40	$ 3,324
1.1.2			Disposal cost of ballast	83.111	CY	$ 15	$ 1,247
2.0.0	Rehabilitation						$ 208
2.1.0		Superstructure					$ 208
2.1.1			Concrete rehabilitation	0.17	CY	$ 1,200	$ 208
3.0.0	Replacement						$ 189,468
3.1.0		Deck					$ 115,481
3.1.1			Install sheet waterproofing on deck	1122	SF	$ 43	$ 48,089
3.1.2			Install 2ft new stone aggregate base	192.62	Tons	$ 55	$ 10,594
3.1.3			Concrete pavement	20.8	CY	$ 1,200	$ 24,933
3.1.4			Install railing	146	LF	$ 192	$ 27,971
3.1.5			Install drainage	33	LF	$ 118	$ 3,894
3.2.0		Finishes					$ 73,987
3.2.1			General clean up/ Graffiti removal	112.2	SF	$ 18	$ 2,020
3.2.2			Install lighting	6	EA	$ 7,600	$ 45,600
3.2.3			Blast clean and apply concrete sealer to entire bridge	1122	SF	$ 24	$ 26,367
4.0.0	Total Direct Cost						$ 194,246
4.0.1			Indirect Costs	20%			$ 38,849
5.0.0	Total Construction Cost						$ 233,096
5.0.1			OH & P	15%			$ 34,964
5.0.2			Escalation	15%			$ 40,209
5.0.3			Contractor Contingency	25%			$ 77,067
6.0.0	Total Construction Price						$ 385,336
6.0.1			Planning and preliminary engineering design	3%			$ 11,560
6.0.2			Final engineering design	7%			$ 26,974
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 7,707
6.0.4			Project and construction management	5%			$ 19,267
6.0.5			Legal, permits, agency reviews	3%			$ 11,560
7.0.0	Total Project Price						$ 462,404
7.0.1			High	30%			$ 601,125
7.0.2			Likely	0%			$ 462,404
7.0.3			Low	-30%			$ 323,683

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Bridge: Passaic River

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 334,560
1.1.0		Substructure					$ 180,000
1.1.1			Pier fender system	3	EA	$ 60,000	$ 180,000
1.2.0		Deck					$ 154,560
1.2.1			Timber deck	12880	SF	$ 12	$ 154,560
2.0.0	Rehabilitation						$ 1,434,894
2.1.0		Superstructure					$ 1,434,894
2.1.1			Repair girders	224	LF	$ 770	$ 172,480
2.1.2			Steel rehabilitation	1288	SF	$ 740	$ 953,120
2.1.3			Concreate patching/spall repair	1.99	CY	$ 58,408	$ 116,094
2.1.4			Masonry Piers	2100	SF	$ 92	$ 193,200
3.0.0	Replacement						$ 1,849,319
3.1.0		Substructure					$ 269,120
3.1.1			Pier fender system	3	EA	$ 39,200	$ 117,600
3.1.2			Bridge bearings	28	EA	$ 5,411	$ 151,520
3.2.0		Deck					$ 694,615
3.2.1			Install precast concrete	12880	SF	$ 25	$ 322,000
3.2.2			Install railing	1200	LF	$ 192	$ 229,895
3.2.3			Install drainage	560	LF	$ 82	$ 45,920
3.2.4			Install fencing over roadways	440	LF	$ 220	$ 96,800
3.3.0		Finishes					$ 885,584
3.3.1			General clean up/ Graffiti removal	1288	SF	$ 18	$ 23,184
3.3.2			Install lighting	52	EA	$ 7,600	$ 395,200
3.3.3			Install furniture	52	EA	$ 1,940	$ 100,880
3.3.4			Blast clean and repaint entire bridge	12880	SF	$ 27	$ 341,320
3.3.5			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 3,438,773
4.0.1			Indirect Costs	20%			$ 687,755
5.0.0	Total Construction Cost						$ 4,126,528
5.0.1			OH & P	15%			$ 618,979
5.0.2			Escalation	15%			$ 711,826
5.0.3			Contractor Contingency	25%			$ 1,364,333
6.0.0	Total Construction Price						$ 6,821,666
6.0.1			Planning and preliminary engineering design	3%			$ 204,650
6.0.2			Final engineering design	7%			$ 477,517
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 136,433
6.0.4			Project and construction management	5%			$ 341,083
6.0.5			Legal, permits, agency reviews	3%			$ 204,650
7.0.0	Total Project Price						$ 8,186,000
7.0.1			High	30%			$ 10,641,799
7.0.2			Likely	0%			$ 8,186,000
7.0.3			Low	-30%			$ 5,730,200

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Bridge: McCarter Highway

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 18,216
1.1.0		Deck					$ 18,216
1.1.1			Timber deck	1518	SF	$ 12	$ 18,216
2.0.0	Rehabilitation						$ 146,460
2.1.0		Superstructure					$ 146,460
2.1.1			Repair girders	26.4	LF	$ 770	$ 20,328
2.1.2			Steel rehabilitation	151.8	SF	$ 740	$ 112,332
2.1.3			Masonry abutments	150	SF	$ 92	$ 13,800
3.0.0	Replacement						$ 226,776
3.1.0		Deck					$ 130,617
3.1.1			Install precast concrete	1518	SF	$ 25	$ 37,950
3.1.2			Install railing	212	LF	$ 192	$ 40,615
3.1.3			Install drainage	66	LF	$ 82	$ 5,412
3.1.4			Install fencing over roadways	212	LF	$ 220	$ 46,640
3.2.0		Finishes					$ 96,159
3.2.1			General clean up/ Graffiti removal	152	SF	$ 18	$ 2,732
3.2.2			Install lighting	7	EA	$ 7,600	$ 53,200
3.2.3			Blast clean and repaint entire bridge	1518	SF	$ 27	$ 40,227
4.0.0	Total Direct Cost						$ 391,452
4.0.1			Indirect Costs	20%			$ 78,290
5.0.0	Total Construction Cost						$ 469,743
5.0.1			OH & P	15%			$ 70,461
5.0.2			Escalation	15%			$ 81,031
5.0.3			Contractor Contingency	25%			$ 155,309
6.0.0	Total Construction Price						$ 776,543
6.0.1			Planning and preliminary engineering design	3%			$ 23,296
6.0.2			Final engineering design	7%			$ 54,358
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 15,531
6.0.4			Project and construction management	5%			$ 38,827
6.0.5			Legal, permits, agency reviews	3%			$ 23,296
7.0.0	Total Project Price						$ 931,852
7.0.1			High	30%			$ 1,211,407
7.0.2			Likely	0%			$ 931,852
7.0.3			Low	-30%			$ 652,296

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Bridge: Newark IT

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 23,460
1.1.0		Deck					$ 23,460
1.1.1			Timber deck	1955	SF	$ 12	$ 23,460
2.0.0	Rehabilitation						$ 184,650
2.1.0		Superstructure					$ 184,650
2.1.1			Repair girders	34	LF	$ 770	$ 26,180
2.1.2			Steel rehabilitation	195.5	SF	$ 740	$ 144,670
2.1.3			Masonry abutments	150	SF	$ 92	$ 13,800
3.0.0	Replacement						$ 274,866
3.1.0		Deck					$ 158,740
3.1.1			Install precast concrete	1955	SF	$ 25	$ 48,875
3.1.2			Install railing	250	LF	$ 192	$ 47,895
3.1.3			Install drainage	85	LF	$ 82	$ 6,970
3.1.4			Install fencing over roadways	250	LF	$ 220	$ 55,000
3.2.0		Finishes					$ 116,127
3.2.1			General clean up/ Graffiti removal	195.5	SF	$ 18	$ 3,519
3.2.2			Install lighting	8	EA	$ 7,600	$ 60,800
3.2.3			Blast clean and repaint entire bridge	1955	SF	$ 27	$ 51,808
4.0.0	Total Direct Cost						$ 482,976
4.0.1			Indirect Costs	20%			$ 96,595
5.0.0	Total Construction Cost						$ 579,571
5.0.1			OH & P	15%			$ 86,936
5.0.2			Escalation	15%			$ 99,976
5.0.3			Contractor Contingency	25%			$ 191,621
6.0.0	Total Construction Price						$ 958,104
6.0.1			Planning and preliminary engineering design	3%			$ 28,743
6.0.2			Final engineering design	7%			$ 67,067
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 19,162
6.0.4			Project and construction management	5%			$ 47,905
6.0.5			Legal, permits, agency reviews	3%			$ 28,743
7.0.0	Total Project Price						$ 1,149,725
7.0.1			High	30%			$ 1,494,642
7.0.2			Likely	0%			$ 1,149,725
7.0.3			Low	-30%			$ 804,807

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Bridge: Broadway

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 34,500
1.1.0		Deck					$ 34,500
1.1.1			Timber deck	2875	SF	$ 12	$ 34,500
2.0.0	Rehabilitation						$ 361,800
2.1.0		Superstructure					$ 361,800
2.1.1			Repair girders	37.5	LF	$ 770	$ 28,875
2.1.2			Steel rehabilitation	431.3	SF	$ 740	$ 319,125
2.1.3			Masonry abutments	150	SF	$ 92	$ 13,800
3.0.0	Replacement						$ 415,509
3.1.0		Deck					$ 217,946
3.1.1			Install precast concrete	2875	SF	$ 25	$ 71,875
3.1.2			Install railing	330	LF	$ 192	$ 63,221
3.1.3			Install drainage	125	LF	$ 82	$ 10,250
3.1.4			Install fencing over roadways	330	LF	$ 220	$ 72,600
3.2.0		Finishes					$ 197,563
3.2.1			General clean up/ Graffiti removal	287.5	SF	$ 18	$ 5,175
3.2.2			Install lighting	12	EA	$ 7,600	$ 91,200
3.2.3			Blast clean and repaint entire bridge	2875	SF	$ 27	$ 76,188
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 811,809
4.0.1			Indirect Costs	20%			$ 162,362
5.0.0	Total Construction Cost						$ 974,170
5.0.1			OH & P	15%			$ 146,126
5.0.2			Escalation	15%			$ 168,044
5.0.3			Contractor Contingency	25%			$ 322,085
6.0.0	Total Construction Price						$ 1,610,425
6.0.1			Planning and preliminary engineering design	3%			$ 48,313
6.0.2			Final engineering design	7%			$ 112,730
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 32,209
6.0.4			Project and construction management	5%			$ 80,521
6.0.5			Legal, permits, agency reviews	3%			$ 48,313
7.0.0	Total Project Price						$ 1,932,510
7.0.1			High	30%			$ 2,512,263
7.0.2			Likely	0%			$ 1,932,510
7.0.3			Low	-30%			$ 1,352,757

ARUP

Essex Hudson Greenway

Date August 27th, 2020

Bridge Second River / Park Drive

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 24,954
1.1.0		Deck					$ 24,954
1.1.1			Remove existing stone ballast	453.7	CY	$ 40	$ 18,148
1.1.2			Disposal cost of ballast	453.7	CY	$ 15	$ 6,806
2.0.0	Rehabilitation						$ 3,403
2.1.0		Superstructure					$ 3,403
2.1.1			Concrete rehabilitation	2.8	CY	$ 1,200	$ 3,403
3.0.0	Replacement						$ 988,427
3.1.0		Deck					$ 597,865
3.1.1			Install geomembrane waterproofing on deck	6125	SF	$ 43	$ 262,518
3.1.2			Install 2ft new stone aggregate base	1051.5	Tons	$ 55	$ 57,834
3.1.3			Concrete paving	113	CY	$ 1,200	$ 136,111
3.1.4			Install railing	350	LF	$ 192	$ 67,053
3.1.5			Install drainage	175	LF	$ 82	$ 14,350
3.1.6			Install fencing over roadways	250	LF	$ 240	$ 60,000
3.2.0		Finishes					$ 390,563
3.2.1			General clean up/ Graffiti removal	612.5	SF	$ 18	$ 11,025
3.2.2			Install lighting	31	EA	$ 7,600	$ 235,600
3.2.3			Blast clean and apply concrete sealer to entire bridge	6125	SF	$ 24	$ 143,938
4.0.0	Total Direct Cost						$ 1,016,783.88
4.0.1			Indirect Costs	20%			$ 203,356.78
5.0.0	Total Construction Cost						$ 1,220,140.65
5.0.1			OH & P	15%			$ 183,021.10
5.0.2			Escalation	15%			$ 210,474.26
5.0.3			Contractor Contingency	25%			$ 403,409.00
6.0.0	Total Construction Price						$ 2,017,045.01
6.0.1			Planning and preliminary engineering design	3%			$ 60,511.35
6.0.2			Final engineering design	7%			$ 141,193.15
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 40,340.90
6.0.4			Project and construction management	5%			$ 100,852.25
6.0.5			Legal, permits, agency reviews	3%			$ 60,511.35
7.0.0	Total Project Price						$ 2,420,454.02
7.0.1			High	30%			$ 3,146,590.22
7.0.2			Likely	0%			$ 2,420,454.02
7.0.3			Low	-30%			$ 1,694,317.81

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Essex Hudson Greenway

Date August 27th, 2020

Bridge Franklin Avenue

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 10,861
1.1.0		Deck					$ 10,861
1.1.1			Remove existing stone ballast	197.5	CY	$ 40	$ 7,899
1.1.2			Disposal cost of ballast	197.5	CY	$ 15	$ 2,962
2.0.0	Rehabilitation						$ 1,481
2.1.0		Superstructure					$ 1,481
2.1.1			Concrete rehabilitation	1	CY	$ 1,200	$ 1,481
3.0.0	Replacement						$ 508,302
3.1.0		Deck					$ 309,452
3.1.1			Install sheet waterproofing on deck	2666	SF	$ 43	$ 114,265
3.1.2			Install 2ft new stone aggregate base	458	Tons	$ 55	$ 25,173
3.1.3			Concrete paving	49	CY	$ 1,200	$ 59,244
3.1.4			Install railing	252	LF	$ 192	$ 48,278
3.1.5			Install drainage	86	LF	$ 82	$ 7,052
3.1.6			Install fencing over roadways	252	LF	$ 220	$ 55,440
3.2.0		Finishes					$ 198,850
3.2.1			General clean up/ Graffiti removal	266.6	SF	$ 18	$ 4,799
3.2.2			Install lighting	14	EA	$ 7,600	$ 106,400
3.2.3			Blast clean and apply concrete sealer to entire bridge	2666	SF	$ 24	$ 62,651
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 520,644.47
4.0.1			Indirect Costs	20%		$ 520,644.47	$ 104,128.89
5.0.0	Total Construction Cost						$ 624,773.37
5.0.1			OH & P	15%			$ 93,716.01
5.0.2			Escalation	15%			$ 107,773.41
5.0.3			Contractor Contingency	25%			$ 206,565.70
6.0.0	Total Construction Price						$ 1,032,828.48
6.0.1			Planning and preliminary engineering design	3%			$ 30,984.85
6.0.2			Final engineering design	7%			$ 72,297.99
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 20,656.57
6.0.4			Project and construction management	5%			$ 51,641.42
6.0.5			Legal, permits, agency reviews	3%			$ 30,984.85
7.0.0	Total Project Price						$ 1,239,394.17
7.0.1			High	30%			$ 1,611,212.42
7.0.2			Likely	0%			$ 1,239,394.17
7.0.3			Low	-30%			$ 867,575.92

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Essex Hudson Greenway

Date August 27th, 2020

Bridge: Garden State Parkway

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 71,369
1.1.0		Deck					$ 71,369
1.1.1			Timber deck	4440	SF	$ 12	$ 53,280
1.1.2			Remove existing stone ballast	328.9	CY	$ 40	$ 13,156
1.1.3			Disposal cost of ballast	328.9	CY	$ 15	$ 4,933
2.0.0	Rehabilitation						$ 373,722
2.1.0		Superstructure					$ 373,722
2.1.1			Repair girders	48	LF	$ 770	$ 36,960
2.1.2			Steel rehabilitation	444	SF	$ 740	$ 328,560
2.1.3			Concrete rehabilitation	0.69	CY	$ 11,970	$ 8,202
3.0.0	Replacement						$ 759,886
3.1.0		Deck					$ 472,434
3.1.1			Install sheet waterproofing on deck	4440	SF	$ 43	$ 190,298
3.1.2			Install 2ft new stone aggregate base	762.2	Tons	$ 55	$ 41,923
3.1.3			Concrete paving	82	CY	$ 1,200	$ 98,667
3.1.4			Install railing	320	LF	$ 192	$ 61,305
3.1.5			Install drainage	120	LF	$ 82	$ 9,840
3.1.6			Install fencing over roadways	320	LF	$ 220	$ 70,400
3.2.0		Finishes					$ 287,452
3.2.1			General clean up/ Graffiti removal	444	SF	$ 18	$ 7,992
3.2.2			Install lighting	18	EA	$ 7,600	$ 136,800
3.2.3			Blast clean and repaint entire bridge	4440	SF	$ 27	$ 117,660
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 1,204,976
4.0.1			Indirect Costs	20%			$ 240,995
5.0.0	Total Construction Cost						$ 1,445,972
5.0.1			OH & P	15%			$ 216,896
5.0.2			Escalation	15%			$ 249,430
5.0.3			Contractor Contingency	25%			$ 478,074
6.0.0	Total Construction Price						$ 2,390,372
6.0.1			Planning and preliminary engineering design	3%			$ 71,711
6.0.2			Final engineering design	7%			$ 167,326
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 47,807
6.0.4			Project and construction management	5%			$ 119,519
6.0.5			Legal, permits, agency reviews	3%			$ 71,711
7.0.0	Total Project Price						$ 2,868,446
7.0.1			High	30%			$ 3,728,980
7.0.2			Likely	0%			$ 2,868,446
7.0.3			Low	-30%			$ 2,007,912

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Essex Hudson Greenway

Date August 27th, 2020

Bridge: JFK Drive

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 48,840
1.1.0		Deck					$ 48,840
1.1.1			Timber deck	4070	SF	$ 12	$ 48,840
2.0.0	Rehabilitation						$ 210,586
2.1.0		Superstructure					$ 210,586
2.1.1			Repair girders	22	LF	$ 770	$ 16,940
2.1.2			Steel rehabilitation	203.5	SF	$ 740	$ 150,590
2.1.3			Masonry abutments	468	SF	$ 92	$ 43,056
3.0.0	Replacement						$ 509,625
3.1.0		Deck					$ 240,244
3.1.1			Install precast concrete	4070	SF	$ 25	$ 101,750
3.1.2			Install railing	300	LF	$ 192	$ 57,474
3.1.3			Install drainage	110	LF	$ 82	$ 9,020
3.1.4			Install fencing over roadways	300	LF	$ 240	$ 72,000
3.2.0		Finishes					$ 269,381
3.2.1			General clean up/ Graffiti removal	407	SF	$ 18	$ 7,326
3.2.2			Install lighting	17	EA	$ 7,600	$ 129,200
3.2.3			Blast clean and repaint entire bridge	4070	SF	$ 27	$ 107,855
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 769,051
4.0.1			Indirect Costs	20%			$ 153,810
5.0.0	Total Construction Cost			0%			$ 922,861
5.0.1			OH & P	15%			$ 138,429
5.0.2			Escalation	15%			$ 159,193
5.0.3			Contractor Contingency	25%			$ 305,121
6.0.0	Total Construction Price			0%			$ 1,525,604
6.0.1			Planning and preliminary engineering design	3%			$ 45,768
6.0.2			Final engineering design	7%			$ 106,792
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 30,512
6.0.4			Project and construction management	5%			$ 76,280
6.0.5			Legal, permits, agency reviews	3%			$ 45,768
7.0.0	Total Project Price			0%			$ 1,830,725
7.0.1			High	30%			$ 2,379,943
7.0.2			Likely	0%			$ 1,830,725
7.0.3			Low	-30%			$ 1,281,508

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Essex Hudson Greenway

Date August 27th, 2020

Bridge: Spruce Street

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 26,880
1.1.0		Deck					$ 26,880
1.1.1			Timber deck	2240	SF	$ 12	$ 26,880
2.0.0	Rehabilitation						$ 326,016
2.1.0		Superstructure					$ 326,016
2.1.1			Repair girders	84	LF	$ 770	$ 64,680
2.1.2			Steel rehabilitation	336	SF	$ 740	$ 248,640
2.1.3			Masonry abutments	138	SF	$ 92	$ 12,696
3.0.0	Replacement						$ 331,331
3.1.0		Deck					$ 174,539
3.1.1			Install precast concrete	2240	SF	$ 25	$ 56,000
3.1.2			Install railing	240	LF	$ 192	$ 45,979
3.1.3			Install drainage	80	LF	$ 82	$ 6,560
3.1.4			Install fencing over roadways	300	LF	$ 220	$ 66,000
3.2.0		Finishes					$ 156,792
3.2.1			General clean up/ Graffiti removal	224	SF	$ 18	$ 4,032
3.2.2			Install lighting	9	EA	$ 7,600	$ 68,400
3.2.3			Blast clean and repaint entire bridge	2240	SF	$ 27	$ 59,360
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 684,227
4.0.1			Indirect Costs	20%			$ 136,845
5.0.0	Total Construction Cost						$ 821,072
5.0.1			OH & P	15%			$ 123,161
5.0.2			Escalation	15%			$ 141,635
5.0.3			Contractor Contingency	25%			$ 271,467
6.0.0	Total Construction Price						$ 1,357,335
6.0.1			Planning and preliminary engineering design	3%			$ 40,720
6.0.2			Final engineering design	7%			$ 95,013
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 27,147
6.0.4			Project and construction management	5%			$ 67,867
6.0.5			Legal, permits, agency reviews	3%			$ 40,720
7.0.0	Total Project Price						$ 1,628,802
7.0.1			High	30%			$ 2,117,443
7.0.2			Likely	0%			$ 1,628,802
7.0.3			Low	-30%			$ 1,140,162

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Essex Hudson Greenway

Date August 27th, 2020

Bridge: Belleville Ave

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 30,000
1.1.0		Deck					$ 30,000
1.1.1			Timber deck	2500	SF	$ 12	$ 30,000
2.0.0	Rehabilitation						$ 396,462
2.1.0		Superstructure					$ 396,462
2.1.1			Repair girders	105	LF	$ 770	$ 80,850
2.1.2			Steel rehabilitation	375	SF	$ 740	$ 277,500
2.1.3			Masonry abutments	124	SF	$ 92	$ 11,426
2.1.4			Repair Columns	12	LF	$ 2,210	$ 26,686
3.0.0	Replacement						$ 362,092
3.1.0		Deck					$ 190,342
3.1.1			Install precast concrete	2500	SF	$ 25	$ 62,500
3.1.2			Install railing	280	LF	$ 192	$ 53,642
3.1.3			Install drainage	100	LF	$ 82	$ 8,200
3.1.4			Install fencing over roadways	300	LF	$ 220	$ 66,000
3.2.0		Finishes					$ 171,750
3.2.1			General clean up/ Graffiti removal	250	SF	$ 18	$ 4,500
3.2.2			Install lighting	10	EA	$ 7,600	$ 76,000
3.2.3			Blast clean and repaint entire bridge	2500	SF	$ 27	$ 66,250
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 788,554
4.0.1			Indirect Costs	20%			$ 157,711
5.0.0	Total Construction Cost						$ 946,265
5.0.1			OH & P	15%			$ 141,940
5.0.2			Escalation	15%			$ 163,231
5.0.3			Contractor Contingency	25%			$ 312,859
6.0.0	Total Construction Price						$ 1,564,295
6.0.1			Planning and preliminary engineering design	3%			$ 46,929
6.0.2			Final engineering design	7%			$ 109,501
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 31,286
6.0.4			Project and construction management	5%			$ 78,215
6.0.5			Legal, permits, agency reviews	3%			$ 46,929
7.0.0	Total Project Price						$ 1,877,153
7.0.1			High	30%			$ 2,440,299
7.0.2			Likely	0%			$ 1,877,153
7.0.3			Low	-30%			$ 1,314,007

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Essex Hudson Greenway

Date August 27th, 2020

Bridge: New Street

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 30,360
1.1.0		Deck					$ 30,360
1.1.1			Timber deck	2530	SF	$ 12	$ 30,360
2.0.0	Rehabilitation						$ 455,437
2.1.0	Superstructure						$ 455,437
2.1.1			Repair girders	92	LF	$ 770	$ 70,840
2.1.2			Steel rehabilitation	506	SF	$ 740	$ 374,440
2.1.3			Masonry abutments	110	SF	$ 92	$ 10,157
3.0.0	Replacement						$ 378,268
3.1.0		Deck					$ 198,069
3.1.1			Install precast concrete	2530	SF	$ 25	$ 63,250
3.1.2			Install railing	310	LF	$ 192	$ 59,389
3.1.3			Install drainage	115	LF	$ 82	$ 9,430
3.1.4			Install fencing over roadways	300	LF	$ 220	$ 66,000
3.2.0		Finishes					$ 180,199
3.2.1			General clean up/ Graffiti removal	253	SF	$ 18	$ 4,554
3.2.2			Install lighting	11	EA	$ 7,600	$ 83,600
3.2.3			Blast clean and repaint entire bridge	2530	SF	$ 27	$ 67,045
3.2.4			Install new signage	1	LS	$ 25,000	$ 25,000
4.0.0	Total Direct Cost						$ 864,065
4.0.1			Indirect Costs	20%			$ 172,813
5.0.0	Total Construction Cost						$ 1,036,878
5.0.1			OH & P	15%			$ 155,532
5.0.2			Escalation	15%			$ 178,862
5.0.3			Contractor Contingency	25%			$ 342,818
6.0.0	Total Construction Price						$ 1,714,089
6.0.1			Planning and preliminary engineering design	3%			$ 51,423
6.0.2			Final engineering design	7%			$ 119,986
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 34,282
6.0.4			Project and construction management	5%			$ 85,704
6.0.5			Legal, permits, agency reviews	3%			$ 51,423
7.0.0	Total Project Price						$ 2,056,907
7.0.1			High	30%			$ 2,673,980
7.0.2			Likely	0%			$ 2,056,907
7.0.3			Low	-30%			$ 1,439,835

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Essex Hudson Greenway

Date August 27th, 2020

Bridge: Broad Street

WBS	Lv1	Lv2	Lv3	QTY	Unit	Unit Cost	Subtotal
1.0.0	Demolition						$ 245,760
1.1.0		Deck					$ 245,760
1.1.1			Timber deck	1920	SF	$ 12	$ 23,040
1.1.2			Remove Existing Fence	120	LF	$ 96	$ 11,520
1.1.3			Remove existing stone ballast	3840	CY	$ 40	$ 153,600
1.1.4			Disposal cost of ballast	3840	CY	$ 15	$ 57,600
2.0.0	Rehabilitation						$ -
3.0.0	Replacement						$ 326,067
3.1.0		Deck					$ 256,723
3.1.1			Install sheet waterproofing on deck	1920	SF	$ 43	$ 82,291
3.1.2			Install 2ft new stone aggregate base	329.6196	Tons	$ 55	$ 18,129
3.1.3			Concrete paving	36	CY	$ 1,200	$ 42,667
3.1.4			Install railing	200	LF	$ 192	$ 38,316
3.1.5			Install drainage	60	LF	$ 82	$ 4,920
3.1.6			Install fencing over roadways	320	LF	$ 220	$ 70,400
3.2.0		Finishes					$ 69,344
3.2.1			General clean up/ Graffiti removal	192	SF	$ 18	$ 3,456
3.2.2			Install lighting	8	EA	$ 7,600	$ 60,800
3.2.3			Touch up existing paint system	192	SF	$ 27	$ 5,088
4.0.0	Total Direct Cost						$ 571,827
4.0.1			Indirect Costs	20%			$ 114,365
5.0.0	Total Construction Cost						$ 686,192
5.0.1			OH & P	15%			$ 102,929
5.0.2			Escalation	15%			$ 118,368
5.0.3			Contractor Contingency	25%			$ 226,872
6.0.0	Total Construction Price						$ 1,134,361
6.0.1			Planning and preliminary engineering design	3%			$ 34,031
6.0.2			Final engineering design	7%			$ 79,405
6.0.3			Site investigations surveying, inspections, testing, etc.	2%			$ 22,687
6.0.4			Project and construction management	5%			$ 56,718
6.0.5			Legal, permits, agency reviews	3%			$ 34,031
7.0.0	Total Project Price						$ 1,361,234
7.0.1			High	30%			$ 1,769,604
7.0.2			Likely	0%			$ 1,361,234
7.0.3			Low	-30%			$ 952,863

ARUP

Flag Sheet

Indirects

Item	%
Indirect Costs	20%
OH & P	15%
Escalation	15%
Contractor Contractor Contingency	25%
Planning and preliminary engineering design	3%
Final engineering design	7%
Site investigations surveying, inspections, testing, etc.	2%
Project and construction management	5%
Legal, permits, agency reviews	3%
High	30%
Likely	
Low	-30%