### Appendix C – Cost Estimates

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Project	General	Sullivan	Bridge	over	I ittle	Bay
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Location	Newington/Dover,	NH
Loodion	iter ingreine ereit	

Calculated by MAC Reviewed by GSG

Title

Conceptual Cost Estima

#### Conceptual Cost Estimate Summary

General Sullivan Bridge -	Alternative Initial Capita	I and Life Cycle Co	ost Estimate Summary
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	SEIS Cost Estimates:		
Alt:	Description:	Initial Capital Cost	Life Cycle C (2018 Dollar
No Action	Remove the General Sullivan Bridge and Supporting Substructure Entirely	\$8,000,000	N/A
1D	Rehabilitation of the General Sullivan Bridge - 16' Path	\$43,000,000	\$74,000,00
2E	Superstructure Replacement - Truss Alternative - 16' Path	\$37,750,000	(See Note
3C	Partial Rehabilitation - 16' Path	\$42,250,000	\$61,750,00
4C	Complete Replacement - 16' Path	\$31,750,000	(See Note
6C	Southbound Little Bay Bridge - Widened Deck on Pier Extension - 16' Path	\$28,000,000	\$31,250,00
7B	Southbound Little Bay Bridge - Independent Deck on Pier Extension - 16' Path	\$29,500,000	\$32,250,00
9B	Superstructure Replacement - Girder Alternative - 16' Path	\$28,500,000	\$31,250,00

Notes: 1. "Initial Capital Cost" Is the cost of initial construction to bring the alternative into service. 2. "Life Cycle Cost (2018 Dollars)" Is the total cost to construct and maintain the alternative in todays dollars.

3. Life Cycle Cost estimates for Alternatives 2E and 4C were not completed since these alternatives were eliminated from consideration for other reasons.

4. The costs presented do not include Design Engineering, Permitting or Cultural Resource Mitigation costs.

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### **Conceptual Cost Estimate**

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Project	General Sullivan Bridge over Little Bay
Location	Newington/Dover, NH
Calculated by	MAC
Reviewed by	A second second second
Title	Bridge Removal Only Alte

Project # 52381.01 Sheet Date 2/7/2020 Date

	Conceptual Cost Estimate - Bridge Remov	al Only	1		
16.000	CONCEPTUAL ESTIMATE OF QUANTITIES AND C	OST	r	11-14	Traint
Item No.	Item Description	Unit	Quantity	Unit Cost	Total Cost
500	ACCESS PLATFORM FOR BRIDGE REMOVAL - SPANS 1-3, 8 AND 9 (684 LF)	U	1	\$ 1,300,000	\$ 1,300,000
502.01	SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS	U	1	\$ 1,600,000	\$ 1,600,000
502.02	SUBSTRUCTURE REMOVAL - ABUTMENTS & PIERS	U	( ) (	\$ 1,900,000	\$ 1,900,000
Major Ass	이 것은 것 같은			ms Sub Total	\$ 4,800,000
1)	Item ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-3, 8 AND 9 (684 LF) is a causeway needed for removal of the bridge where water is too shallow for barges.	20	0% Standard	Contingency Sub Total	\$ 960,000 \$ 5,760,000
2)	Item SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS cost considers cost reduction due to no members needing to be salvaged.			6 Mobilization	\$ 576,000
		59	% Constructi	on Inspection	\$ 288,000
3)	Item SUBSTRUCTURE REMOVAL - ABUTMENTS AND PIERS cost consider removing the abutments and piers in their entirety.			Total	\$ 6,624,000
	the abutments and plers in their entirety.		Construction	Engineering	\$ 165,600
			Risk	Contingency	\$ 1,250,000
				Total Cost <sup>E</sup>	\$ 8,000,000
				Total Cost	\$ 8,000,000
Abtor					
- Auto	Standard Continuency cost based on " <i>literus Sub Total</i> " Value				
A)	Standard Contingency cost based on " <i>Items Sub Total</i> " Value Mobilization and Construction Inspection costs based on " <i>Sub Total</i> " Value				
A) B)	Mobilization and Construction Inspection costs based on "Sub Total" Value	1.0	year assu	imed constructio	on duration
B) C)	Mobilization and Construction Inspection costs based on "Sub Total" Value           Construction Engineering =         2.50%         of "Total" value, and is based on	1.0	year assu	imed constructio	on duration
A) B)	Mobilization and Construction Inspection costs based on "Sub Total" Value		100		on duration

//whb/gbl/jaroj/Bedford/52381.01/tech/Bridge/Cost Estimates - SEIS/Bridge Removal Dri/yEndge Removal Only - Conceptual Estimate/Bridge Removal Dri/y = Conceptual Estimate/Bridge

Conceptua tation of Existing General S	AL ESTIMATE OF QUANT ION - SPANS 1-4 & 6-9 (1) AND SELECT MEMBERS TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS	ar Service Life	<b>1D</b> 9, 16' M	Iternative 11 Autiuse Pa Quantity 1 1 1 920 237,000 10 18 28 1 54,000 12,000			1/1 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	5/2019 Total Cost 4,800,00 1,600,00 1,058,00 355,50 50,00 90,00 140,00
Conceptua tation of Existing General S CONCEPTUA FOR BRIDGE CONSTRUCTI REMOVAL - DECK SYSTEM A MOVAL - NEWINGTON ABUT DECK (QC/QA) (F) _, EPOXY COATED (F) GS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DI RS - CHORD MEMBER REPI RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	Title al Cost Estimate - A Sullivan Bridge - 75 Yea AL ESTIMATE OF QUANT ON - SPANS 1-4 & 6-9 (12 AND SELECT MEMBERS TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS	ar Service Life	<b>1D</b> <b>DST</b> <b>Unit</b> U U U U U U U U U U CY LB EA EA U LB LB	Autiuse Pa Quantity 1 1 1 1 920 237,000 10 18 28 1 1 54,000	\$ \$ \$ \$ \$ \$ \$ \$ \$	<i>lidth</i> Unit Cost 4,800,000 1,600,000 1,600,000 1,600,000 1,50 1,50 5,000 5,000 5,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Total Cost 4,800,00 10,00 1,058,00 355,50 50,00 90,00
TATION OF EXISTING General S CONCEPTUA FOR BRIDGE CONSTRUCTI REMOVAL - DECK SYSTEM A MOVAL - NEWINGTON ABUT DECK (QC/QA) (F) -, EPOXY COATED (F) -, EPOXY COATED (F) -, EPOXY COATED (F) -, EPOXY COATED (F) -, SS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DI RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	Sullivan Bridge - 75 Yea AL ESTIMATE OF QUANT ON - SPANS 1-4 & 6-9 (12 AND SELECT MEMBERS TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS	ar Service Life	DST Unit U U U U U C Y LB EA EA EA U LB LB	Quantity 1 1 1 920 237,000 10 18 28 1 54,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Unit Cost 4,800,000 1,600,000 10,000 1,150 1.50 5,000 5,000 5,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Cost 4,800,000 1,600,000 10,000 1,058,000 355,500 50,000 90,000
TATION OF EXISTING General S CONCEPTUA FOR BRIDGE CONSTRUCTI REMOVAL - DECK SYSTEM A MOVAL - NEWINGTON ABUT DECK (QC/QA) (F) -, EPOXY COATED (F) -, EPOXY COATED (F) -, EPOXY COATED (F) -, EPOXY COATED (F) -, SS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DI RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	Sullivan Bridge - 75 Yea AL ESTIMATE OF QUANT ON - SPANS 1-4 & 6-9 (12 AND SELECT MEMBERS TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS	ar Service Life	DST Unit U U U U U C Y LB EA EA EA U LB LB	Quantity 1 1 1 920 237,000 10 18 28 1 54,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Unit Cost 4,800,000 1,600,000 10,000 1,150 1.50 5,000 5,000 5,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Cost 4,800,000 1,600,000 10,000 1,058,000 355,500 50,000 90,000
FOR BRIDGE CONSTRUCTI REMOVAL - DECK SYSTEM / MOVAL - NEWINGTON ABUT DECK (QC/QA) (F) _, EPOXY COATED (F) 	ON - SPANS 1-4 & 6-9 (12 AND SELECT MEMBERS TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS	253 LF)	Unit U U CY LB EA EA EA EA U LB LB	1 1 920 237,000 10 18 28 1 54,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Cost 4,800,000 1,600,000 10,000 1,150 1.50 5,000 5,000 5,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Cost 4,800,000 1,600,000 10,000 1,058,000 355,500 50,000 90,000
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REMOVAL - DECK SYSTEM . MOVAL - NEWINGTON ABUT DECK (QC/QA) (F) ., EPOXY COATED (F)  SS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DI RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	AND SELECT MEMBERS TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS	5	U CY LB EA EA EA U LB LB	1 920 237,000 10 18 28 1 54,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1,600,000 10,000 1,150 1.50 5,000 5,000 5,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1,600,00 10,00 1,058,00 355,50 50,00 90,00
MOVAL - NEWINGTON ABUT DECK (QC/QA) (F) _, EPOXY COATED (F) GS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DI RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	TMENT (PARTIAL) ETAILS, ALL SPANS LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		U CY LB EA EA EA U LB LB	1 920 237,000 10 18 28 1 54,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	10,000 1,150 1.50 5,000 5,000 5,000	\$ \$ \$ \$ <del>\$</del> \$	10,00 1,058,00 355,50 50,00 90,00
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, EPOXY COATED (F) GS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPE RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		LB EA EA U LB LB	237,000 10 18 28 1 54,000	\$ \$ \$ \$ \$	1.50 5,000 5,000 5,000	\$ \$ \$ \$	355,50 50,00 90,00
, EPOXY COATED (F) GS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPE RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		EA EA U LB LB	10 18 28 1 54,000	\$ \$ \$	1.50 5,000 5,000 5,000	\$ \$ \$	355,50 50,00 90,00
SS NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		EA EA U LB LB	10 18 28 1 54,000	\$ \$ \$	5,000 5,000 5,000	\$ \$ \$	50,00 90,00
NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		EA EA U LB LB	18 28 1 54,000	\$ \$ \$	5,000 5,000	\$ \$	90,00
NG REPLACEMENT TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		EA U LB LB	28 1 54,000	\$ \$	5,000	\$	
TURAL SHORING - SPAN 7 RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		U LB LB	1 54,000	\$		1	1.00.00
RS - LOCALIZED REPAIR DE RS - CHORD MEMBER REPE RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		LB LB	54,000	100			115,00
RS - CHORD MEMBER REPI RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SP/ - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	LACEMENT, SPAN 7 H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS		LB		- Y	15	\$	810,00
RS - REPLACE RIVETS WIT RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SP/ - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	H BOLTS, ALL SPANS S, ALL SPANS ANS . SPANS			12,000	\$	15	\$	180.0
RS - NEW BOLT LOCATION - FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	s, all spans ans . spans			20,000	\$	115	\$	2,300,0
- FLOOR SYSTEM, ALL SPA - BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	ANS SPANS		EA	4,000	\$	115	\$	460,00
- BRACING MEMBERS, ALL KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	. SPANS		LB	455.000	\$	6.00	۰ ۶	2,730,00
KISTING STRUCTURAL STE R CRACK CONTROL (F) MPRESSION SEAL EXPANS	and the second se			and the second s	-			
R CRACK CONTROL (F) MPRESSION SEAL EXPANS	EL - ALL SPANS		LB	186,000	\$	8.00	\$	1,488,00
MPRESSION SEAL EXPANS			U	1	\$	6,436,900	\$	6,436,90
			LF	37	\$	100	\$	3,70
RIP SEAL EXPANSION JOIN			LF	19	\$	700	\$	13,30
the the case of the second second			LF	19	\$	800	\$	15,20
DULAR BRIDGE JOINT SYS	TEM (F)		LF	37	\$	1,400	\$	51,80
ERAIL			LF	3,056	\$	300	\$	916,80
SONRY PIERS			LF	11,200	\$	175	\$	1,960,00
S PLATFORM - SPANS 1-4 &			U	1	\$	530,000	\$	530,00
	AY BRIDGE							700,00
PPROACH WORK		£.*	0		2.32			10,00
ORM FOR BRIDGE CONSTR	UCTION - SPANS 1-4 & 6	6-9 (1253					\$ \$	26,824,20
) LF) & trestle (793 LF) neede	ed for all stages of construc	ction.				Sub Total	\$	32,189,04
IRE REMOVAL - DECK SYST	TEM AND SELECT MEMB	BERS cost		-11	07 N	abilization	¢	2 240 00
								3,218,90
				o /o Construi	aon			1,609,45
ICTURAL STEEL - PRACING	MEMBERS ALL SPANS	accounte				/ otal	Ð	37,017,39
				Constructi	on El	ngineering	\$	1,665,78
				-		m film on a m	¢	1050.0
				RIS				4,250,00
	New York County II Station			- 2	T	otal Cost <sup>E</sup>	\$	43,000,0
	APPROACH WORK DRM FOR BRIDGE CONSTR 0 LF) & trestle (793 LF) neede URE REMOVAL - DECK SYS f removal without damaging m UCTURAL STEEL - BRACING rection detailing and field fitting TH APPROACH WORK carri	DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6 0 LF) & trestle (793 LF) needed for all stages of constru URE REMOVAL - DECK SYSTEM AND SELECT MEMI f removal without damaging members that are to UCTURAL STEEL - BRACING MEMBERS, ALL SPANS rection detailing and field fitting. TH APPROACH WORK carries cost for minor approact abutment - no work anticipated behind the Dover abutm	NPPROACH WORK           DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253           0 LF) & trestle (793 LF) needed for all stages of construction.           URE REMOVAL - DECK SYSTEM AND SELECT MEMBERS cost fremoval without damaging members that are to           UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts section detailing and field fitting.           ITH APPROACH WORK carries cost for minor approach work abutment - no work anticipated behind the Dover abutment.	NPPROACH WORK       U         DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253         0 LF) & trestle (793 LF) needed for all stages of construction.         URE REMOVAL - DECK SYSTEM AND SELECT MEMBERS cost fremoval without damaging members that are to         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts rection detailing and field fitting.         TH APPROACH WORK carries cost for minor approach work abutment - no work anticipated behind the Dover abutment.	NPPROACH WORK       U       1         DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253       20% Standa         D LF) & trestle (793 LF) needed for all stages of construction.       20% Standa         URE REMOVAL - DECK SYSTEM AND SELECT MEMBERS cost       10         f removal without damaging members that are to       5% Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       5% Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction.	APPROACH WORK       U       1       \$         DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253       20% Standard Co         D LF) & trestle (793 LF) needed for all stages of construction.       20% Standard Co         URE REMOVAL - DECK SYSTEM AND SELECT MEMBERS cost       10% M         f removal without damaging members that are to       5% Construction         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       5% Construction EI         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction EI         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction EI         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction EI         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction EI         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction EI         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts       Construction EI         UCTURAL STEEL - BRACING MEMBERS (SOLD)       Construction EI         UCTURAL STEEL - BRACING MEMBERS (SOLD)       Construction EI         UCTURAL STEEL - BRACING MEMBERS (SOLD)       Construction EI         ULT APPROACH WORK (SOLD)       Construction EI         Abutment - no work anticipated behind the Dover abutment.       T	U       1       \$ 10,000         Items Sub Total       Items Sub Total         DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253       20% Standard Contingency         DLF) & trestle (793 LF) needed for all stages of construction.       Sub Total         URE REMOVAL - DECK SYSTEM AND SELECT MEMBERS cost fremoval without damaging members that are to       10% Mobilization         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts neetion detailing and field fitting.       Construction Engineering         NTH APPROACH WORK carries cost for minor approach work abutment - no work anticipated behind the Dover abutment.       Risk Contingency	U       1       \$ 10,000       \$         Items Sub Total       \$       Items Sub Total       \$         DRM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253       20% Standard Contingency       \$         DLF) & trestle (793 LF) needed for all stages of construction.       20% Standard Contingency       \$         URE REMOVAL - DECK SYSTEM AND SELECT MEMBERS cost freemoval without damaging members that are to       10% Mobilization       \$         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts neetion detailing and field fitting.       5% Construction Inspection       \$         UCTURAL STEEL - BRACING MEMBERS, ALL SPANS accounts abutment - no work anticipated behind the Dover abutment.       Construction Engineering       \$

### **Conceptual Cost Estimate**

whb

Project	General Sullivan Bridge of	ver Little Bay
Location	Newington/Dover, NH	
Calculated by	MAC	
Reviewed by	GSG	
Title		Alternative 2E

Project # 52381.01 Sheet

Date 1/15/2019 Date 1/15/2019

	Reviewed by GSG				Date	1/1	5/2019
	Title	= 1	Alternative 2	E		-	
		_					
	Conceptual Cost Estimate - Alternati	ve 2E			-		
	Replacement of Existing General Sullivan Bridge Superstructure with New Truss	Superst	ructure, 16' I	Viulti	iuse Path W	/idth	7
_	CONCEPTUAL ESTIMATE OF QUANTITIES AND	COST		-			-
ltem		The second	La.	1	Unit	-	Total
No.	Item Description	Unit	Quantity	11	Cost		Cost
500	ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)	U	1	\$	4,800,000	\$	4,800,0
502.01	SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS	U	1	\$	1,100,000	\$	1,100,0
502.02	SUBSTRUCTURE REMOVAL - NEWINGTON ABUTMENT & PIER 7 (PARTIAL)	U	1	\$	45,000	\$	45,0
520.12	CONCRETE CLASS A, ABOVE FOOTINGS (F)	CY	120	\$	1,300	\$	156,0
520.7002	CONCRETE BRIDGE DECK (QC/QA) (F)	CY	880	\$	1,150	\$	1,012,0
544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	247,000	\$	1.50	\$	370,5
548.21	ELASTOMERIC BEARING ASSEMBLIES (F)	EA	32	\$	5,000	\$	160,0
559.41	ASPHALTIC PLUG FOR CRACK CONTROL (F)	LF	55	\$	100	\$	5,5
560.1001	PREFABRICATED COMPRESSION SEAL EXPANSION JOINT (F)	LF	37	\$	700	S	25,9
561.2	PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)	LF	55	\$	1,400	\$	77,0
563	PEDESTRIAN BRIDGE RAIL	LF	3,056	\$	300	\$	916,8
569.01	PREFABRICATED TRUSS - FAB. & DELIVERED, SPANS 1-3 & 7-9, 18'-4" WIDE	LB	1,300,000	\$	4.00	\$	5,200,0
569.02	PREFABRICATED TRUSS - FAB. & DELIVERED, SPANS 4-6, 21-0" WIDE	LB	1,070,000	S	4.00	\$	4,280,0
569.03	PREFABRICATED TRUSS - METALIZED & COLORED, ALL SPANS	SF	125,000	\$	13.50	\$	1,687,5
569.04	PREFABRICATED TRUSS - ERECTED, ALL SPANS	LB	2,370,000	S	1.40	\$	3,318,0
571	REPOINT STONE MASONRY PIERS	LF	11,200	\$	175	\$	1,960,0
1002	TEMPORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE	U	1	S	700,000	\$	700,0
1002	PERMANENT PATH APPROACH WORK	U	1	\$	10,000	\$	10,0
		0			Sub Total		
<u>Major Ass</u> 1)	Item ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253						25,824,2
0	LF) is a causeway (460 LF) & trestle (793 LF) needed for all stages of construction.		20% Standar		Sub Total	\$ \$	5,164,8- 30,989,0-
2)	Item SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS cost						
-/	considers cost reduction due to no members needing to be salvaged.				lobilization	\$	3,098,9
			5% Construc	tion	and the second s		
3)	Item SUBSTRUCTURE REMOVAL - NEWINGTON ABUTMENT & PIER 7 (PARTIAL) includes the removal of the Newington abutment structural topping slab, and the top				Total	\$	35,637,3
	portion of Pier 7.		Constructio	on Ei	ngineering	\$	890,9
4)	In item PREFABRICATED TRUSS - FAB & DELIVERED, SPANS 1-3 & 7-9, 18'-4" WIDE		Ris	k Co	ontingency	\$	1,250,0
	the out-to-out spacing of truss chords is set equal to the overall bridge deck width (path			_		_	
	width plus curb widths) as these spans are not governed by wind overturning forces.			T	otal Cost <sup>E</sup>	\$	37,750,0
5)	In item PREFABRICATED TRUSS - FAB & DELIVERED, SPANS 4-6, 21'-0" WIDE, the						
	out-to-out spacing of truss chords is determined by comparing wind overturning forces to truss and deck system self weight, and chord spacing. Heavier structure & wider spacing						
	= more overturning resistance.						
6)	Item PERMANENT PATH APPROACH WORK carries cost for minor work behind the						
	Newington abutment - no work anticipated behind the Dover abutment.						
7)	Life cycle costs are NOT included in this estimate.						
Notes:							
A)	Standard Contingency cost based on "Items Sub Total" Value						
B)	Mobilization and Construction Inspection costs based on "Sub Total" Value						
C)	Construction Engineering = 2.5% of "Total" value, and is based on	1.0	year assu	imec	l construction	dur	ation
D)	Risk Contingency Cost is approximately = 4% of "Sub Total" value						

int.	Conceptual Cost E	stim	ate				
0	Project General Sullivan Bridg Location Newington/Dover, NH Calculated by MAC Reviewed by GSG	e over l	Little Bay		Project #	523	81.01
-	Location Newington/Dover, NH				Sheet		
	Calculated by MAC						5/2019
	Reviewed by GSG						5/2019
	Title	_	Alternative 3	SC			
R	<b>Conceptual Cost Estimate - Alternati</b> eplacement of General Sullivan Bridge Approach Spans (1-3 & 7-9) with New Tru		erstructure, t	16' N	Iultiuse Pat	hΝ	/idth
	CONCEPTUAL ESTIMATE OF QUANTITIES AND	COST		r		_	
item No.	Item Description	Unit	Quantity		Unit Cost		Total Cost
500	ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)	U	1.00	\$	4,800,000	\$	4,800,00
502.01	SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND TRUSS SPANS 1-3 & 7-9	U	1	\$	1,300,000	\$	1,300,00
502.02	SUBSTRUCTURE REMOVAL - NEWINGTON ABUTMENT & PIER 7 (PARTIAL)	U	1.244	\$	45,000	\$	45,00
520.12	CONCRETE CLASS A, ABOVE FOOTINGS (F)	CY	120	\$	1,300	\$	156,00
520.7002	CONCRETE BRIDGE DECK (QC/QA) (F)	CY	920	\$	1,150	\$	1,058,00
544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	257,000	\$	1.50	\$	385,50
548.03	JACKING FOR BEARING REPLACEMENT	EA	8	\$	5,000.00	\$	40,00
548.21	ELASTOMERIC BEARING ASSEMBLIES (F)	EA	32	\$	5,000	\$	160,00
550.02	STEEL TRUSS REPAIRS - LOCALIZED REPAIR DETAILS, SPANS 4, 5 & 6	LB	33,000	\$	15	\$	495,00
550.04	STEEL TRUSS REPAIRS - REPLACE RIVETS WITH BOLTS, SPANS 4, 5 & 6	EA	14,500	\$	115.00	\$	1,667,50
550.05	STEEL TRUSS REPAIRS - NEW BOLT LOCATIONS, SPANS 4, 5 & 6	EA	1,250	\$	115.00	\$	143,75
550.06	STRUCTURAL STEEL - FLOOR SYSTEM, SPANS 4, 5 & 6	LB	285,000	\$	6.00	\$	1,710,00
550.07	STRUCTURAL STEEL - BRACING MEMBERS, SPANS 4, 5 & 6	LB	82,000	\$	8.00	\$	656,00
556	CLEAN AND PAINT EXISTING STRUCTURAL STEEL	U	1	\$	3,399,100	\$	3,399,10
559.41		LF	55	\$	100	\$	5,50
560.1001	PREFABRICATED COMPRESSION SEAL EXPANSION JOINT (F)	LF	37	\$	700	\$	25,90
561.2	PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)	LF LF	55	\$ \$	1,400	\$	77,00
563 569.01		LF	3,056	\$	300 4.00	\$	916,80 5,200,00
569.03	PREFABRICATED TRUSS - FAB. & DELIVERED, SPANS 1-3 & 7-9, 18'-4" WIDE PREFABRICATED TRUSS - METALIZED & COLORED, SPANS 1-3 & 7-9	SF	69,000	\$	13.50	\$ \$	931,50
569.04	PREFABRICATED TRUSS - ERECTED, SPANS 1-3 & 7-9	LB	1,300,000	\$	1.40	\$	1,820,00
571	REPOINT STONE MASONRY PIERS	LF	11,200	\$	1,40	\$	1,960,00
1001	PERMANENT ACCESS PLATFORM, SPANS 4 & 6	U	1	\$	170,000	\$	170,00
1002	TEMPORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE	U	1	\$	700,000	s	700,00
1003	PERMANENT PATH APPROACH WORK	U	1	\$	10,000		10,00
	umptions:				Sub Total	\$	27,832,55
1)	Item ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF) is a causeway (460 LF) & trestle (793 LF) needed for all stages of construction.		20% Standa	rd C	ontingency Sub Total	\$ \$	5,566,51 33,399,06
2)	Item SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND TRUSS SPANS 1-3 & 7-			no/ •	(abilization		0 000 00
-/	9 considers removal of entire deck system, spans 1-3 and 7-9, and select bracing				Aobilization	\$	3,339,90
	members in spans 4-6. The cost considers cost reduction due to no members being		5% Constru	cuon	Inspection Total	\$ \$	1,669,95 38,408,91
	salvaged in spans 1-3 and 7-9, and cost increase due to complexity of removal of members within spans to remain.					Ð	50,700,91
3)	In item PREFABRICATED TRUSS - FAB. & DELIVERED, SPANS 1-3 & 7-9, 18'-4"		Constructi			\$	1,344,31
	WIDE the out-to-out spacing of truss chords is set equal to the overall bridge width (path width plus curb widths) as these spans are not governed by wind overturning forces.		Rı	_	ontingency otal Cost <sup>E</sup>	\$ \$	2,500,00 42,250,00
4)	Life cycle costs are NOT included in this estimate.						
Votes:							
A)	Standard Contingency cost based on "Items Sub Total" Value						
B)	Mobilization and Construction Inspection costs based on "Sub Total" Value			1			
C)	Construction Engineering = 3.5% of "Tota/" value, and is based on	2.0	year assur	ned	construction (	dura	tion
D)	Risk Contingency Cost is approximately = 7% of "Sub Tota/" value						
E)	Total Cost is the sum of "Total", "Construction Engineering" and "Risk Contingency" cost				250,000		
F)	Vessel Collision loading/protection criteria is to be waived by the New Hampshire DOT, Bu	ireau of	Bridge Design	1			

(\vhb\gb\proj\Bedford\52381.01\tech\Bridge\Cost Estimates - SEIS\Alternative 3\Alternative 3C - 16' Path - Conceptual Estimate

F) Vessel Collision loading/protection criteria is to be waived by the New Hampshire DOT, Bureau of Bridge Design

(\/vhb\gbl\proj\Bedford\52381.01\tech\Bridge\Cost Estimates - SEIS\Alternative 2\Alternative 2 = 16' Path - Conceptual Estimate\Alternative 2E - 16' Path - Conceptual Estimate

G) Cultural Resource mitigation cost is not included in this conceptual estimate.

Project General Sullivan Bridge on Location Newington/Dover, NH Calculated by MAC Reviewed by GSG Title		e Bay	-	Project # Sheet	-	81.01
Conceptual Cost Estimate - Alternative		ernative 4C			-	<b>5/2019</b> 5/2019
Complete Replacement of General Sullivan Bridge, 16' Multiu.		Width				
CONCEPTUAL ESTIMATE OF QUANTITIES AND CO	ST		-			
Description	Unit	Quantity		Unit Cost	ŀ.	Total Cost
CESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)	U	1	\$	5,400,000	\$	5,400,000
PERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS	U	1	\$	1,100,000	\$	1,100,000
STRUCTURE REMOVAL - ABUTMENTS & PIERS	U	1	\$	1,900,000	\$	1,900,000
LLED SHAFT PIER, CAP AND REINFORCEMENT	EA	8	\$	640,000	\$	5,120,000
ITMENT	EA	2	\$	250,000	\$	500,000
NCRETE BRIDGE DECK (QC/QA) (F)	CY	920	\$	1,150	\$	1,058,000
	LB	240.000	\$		\$	360,000
STOMERIC BEARING ASSEMBLIES (F)	EA	30	\$	5.000	\$	150,000
	LB	1,790,000	\$		\$	3,759,000
	10 M.		-		-	51,800
	P 1		-			916,800
			-		-	700,000
		1000	-		-	10,000
	4		-		-	21,025,600
ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)	20		Con	tingency	\$	4,205,120 25,230,720
	59				\$	2,523,072 1,261,536
lar dimensions to the SBLBB. Cost includes rock socket, shaft casing, stainless steel forcement (within drilled shaft only), epoxy reinforcement, specialized equipment		Construction	Eng	Total lineering	\$ \$	29,015,328 1,015,536
		Risk	Con	tingency	\$	1,750,000
그 가슴 생활은 것 이렇게 잘 하는 것 같아요. 잘 한 것을 수 있었다. 또 가슴 감독하는 것 같은 것 같아요. 것 같아요. 것 같아요. 한 것 같아요. 한 것 같아요. 것 같아요. 것 같아요. 것 같아요. 그 그 그 것 같아요. ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?			Tot	al Cost <sup>E</sup>	\$	31,750,000
cycle costs are NOT included in this estimate.						
th. A 12' path technically meets aeroelastic instability limits defined by the AASHTO D Manual; however there is concern from an engineering judgement standpoint with						
	Description         NOTOCING STEEL, ADUATION AND ENTRES         DESCRIPTION         NFORCING STEEL, POXY COATED (F)         STOMERIC BEARING ASSEMBLIES (F)         UCTURAL STEEL - WEATHERING (F)         DESCRIAN BRIDGE RAIL         MPORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE         MANENT PATH APPROACH WORK         DESCRIAN BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)         Causeway (460 LF) & trestle (793 LF) needed for all stages of construction.         DESUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS cost         Siders cost reduction due to no members needing to be salvaged.         DRILLED SHAFT PIER, CAP AND REINFORCEMENT is a single	In Description         Unit           DESCRIPTION         Unit           DESCRIPTION         Unit           DESCRIPTION         U           DESCRIPTION         U           DESCRIPTION         U           DESCRIPTION         U           DESCRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS         U           DISTRUCTURE REMOVAL - ABUTMENTS & PIERS         U           LLED SHAFT PIER, CAP AND REINFORCEMENT         EA           JTMENT         EA           NCRETE BRIDGE DECK (QC/QA) (F)         CY           NFORCING STEEL, EPOXY COATED (F)         LB           STOMERIC BEARING ASSEMBLIES (F)         EA           RUCTURAL STEEL - WEATHERING (F)         LF           DESTRIAN BRIDGE RAIL         LF           MORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE         U           RMANENT PATH APPROACH WORK         U           202:         A CCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)           causeway (460 LF) & trestle (793 LF) needed for all stages of construction.           A SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS cost           siders cost reduction due to no members needing to be salvaged.           DESTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS cost           Siders cost treductin fom SBLBB bid tabulat	n Description       Unit       Quantity         DESC PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)       U       1         PERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS       U       1         DSTRUCTURE REMOVAL - ABUTMENTS & PIERS       U       1         LLED SHAFT PIER, CAP AND REINFORCEMENT       EA       8         TMENT       EA       2         VCRETE BRIDGE DECK (QC/QA) (F)       CY       920         NFORCING STEEL, EPOXY COATED (F)       LB       240,000         STOMERIC BEARING ASSEMBLIES (F)       EA       30         NUCTURAL STEEL - WEATHERING (F)       LB       1,790,000         EFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)       LF       3,056         MPORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE       U       1         ROCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)       10%         causeway (460 LF) & trestie (793 LF) needed for all stages of construction.       10         n DRILLED SHAFT PIER, CAP AND REINFORCEMENT is a single drilled shaft pier of far dimensions to the SBLBB. Cost includes rock socket, shaft casing, stainless steel forcement (within drilled shaft only), epoxy reinforcement, specialized equipment dillization and oncorete. Cost derived from SBLBB bid tabulation and increased by 16% ecommended by consumer price index.       Risk         N PERMANENT PATH APPROACH WORK carries cost for minor a	n Description       Unit       Quantity         DESC PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)       U       1       \$         PERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS       U       1       \$         SSTRUCTURE REMOVAL - ABUTMENTS & PIERS       U       1       \$         LLED SHAFT PIER, CAP AND REINFORCEMENT       EA       8       \$         JTMENT       EA       2       \$         NCRETE BRIDGE DECK (QC/QA) (F)       CY       920       \$         NCRETE BRIDGE DECK (QC/QA) (F)       EA       30       \$         NCORCING STEEL, EPOXY COATED (F)       LB       240,000       \$         STOMERIC BEARING ASSEMBLIES (F)       LB       1,790,000       \$         UCTURAL STEEL - WEATHERING (F)       LF       3,056       \$         DESTRIAN BRIDGE RAIL       LF       3,056       \$         MORORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE       U       1       \$         MANENT PATH APPROACH WORK       U       1       \$       20% Standard Concorect (within drilde shaft only, epoyreinforcement, specialized equipment diving dideshaft only, epoyreinforcement, specialized equipment d	Description         Unit         Quantity         Unit Cost           D2ESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)         U         1         \$ 5,000,000           PERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS         U         1         \$ 1,100,000           STRUCTURE REMOVAL - ABUTMENTS & PIENS         U         1         \$ 1,000,000           LLED SHAFT PIER, CAP AND REINFORCEMENT         EA         8         \$ 640,000           JTMENT         EA         8         \$ 640,000           VCRETE BRIDGE DECK (QC/QA) (F)         CY         920         \$ 1,150           NFORCING STEEL, EPOXY COATED (F)         LB         240,000         \$ 1.50           SITOMERIC BEARING ASSEMBLIES (F)         EA         30         \$ 5,000           RUCTURAL STEEL - WEATHERING (F)         LB         1,790,000         \$ 2.10           STOMERIC BEARING ASSEMBLIES (F)         LB         1,790,000         \$ 2.10           REFEARING ASSEMBLIES (F)         LB         1,790,000         \$ 2.10           REARING ASSEMBLIES (F)         LB         1         \$ 1,000,000           RUCTURAL STEEL - WEATHERING (F)         LF         3,7<	Description       Unit       Quantity       Unit Cost         D2ESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 14 & 6-9 (1253 LF)       U       1       \$ 5,400,000       \$         2FERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTRE TRUSS       U       1       \$ 1,100,000       \$         STRUCTURE REMOVAL - ABUTMENTS & PIERS       U       1       \$ 1,100,000       \$         SITUCTURE REMOVAL - ABUTMENTS & PIERS       U       1       \$ 1,000,000       \$         LLED SHAFT PIER, CAP AND REINFORCEMENT       EA       8       \$ 640,000       \$         JTMENT       EA       2       \$ 250,000       \$         VCRETE BRIDGE DECK (QC/QA) (F)       CY       920       \$ 1,150       \$         STOMERIC BEARING ASSEMBLIES (F)       EA       30       \$ 5,000       \$         RUCTURAL STEEL - WEATHERING (F)       LB       1,790,000       \$ 2,10       \$         STOMERIC BARING ASSEMBLIES (F)       LB       1,790,000       \$ 2,10       \$         RUCTURAL STEEL - WEATHERING (F)       LF       37       \$ 1,400       \$         DESTRIAN BRIDGE RAIL       LF       3,056       \$ 300       \$         APORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE       U       1       \$ 700,000       \$

	Project Location Calculated by Reviewed by Title
	Conceptual Cost Es Southbound Little Bay Bridge Superstructure Wider
	CONCEPTUAL ESTIMAT
ltem No.	Item Description
500	ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS
502.01	SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRI
502.02	SUBSTRUCTURE REMOVAL - ABUTMENTS, PIER 1, & PIER 7
502.03	STRUCTURE REMOVAL - DOVER APPROACH BRIDGE
509	DRILLED SHAFT PIER, CAP AND REINFORCEMENT
520	ABUTMENTS
520.01	CONCRETE CLASS AA - PRECAST PIER COLUMN
520.02	CONCRETE CLASS AA - PIER CAP EXTENSION
520.7002	CONCRETE BRIDGE DECK (QC/QA) (F)
544.2	REINFORCING STEEL, EPOXY COATED (F)
548	PINNED BEARING FOR PIER COLUMN
548.21	ELASTOMERIC BEARING ASSEMBLIES (F)
550.1	STRUCTURAL STEEL - WEATHERING (F)
559.41	ASPHALTIC PLUG FOR CRACK CONTROL (F)
561.2	PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)
563	PEDESTRIAN BRIDGE RAIL
563.01	PROTECTIVE SCREENING
571	REPOINT STONE MASONRY PIERS
592	DOVER APPROACH MSE WALL
606	CONCRETE BARRIER, DOUBLE-FACED
606.41741	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL -
619.1	MAINTENANCE OF TRAFFIC
1002	TEMPORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE
1003	PERMANENT PATH APPROACH WORK
Major Assu	
1)	Item ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SF LF) is a causeway (460 LF) & trestle (793 LF) needed for all stage
2)	Item SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND EN considers cost reduction due to no members needing to be salvage
3)	Item DRILLED SHAFT PIER, CAP AND REINFORCEMENT is a pier of similar dimensions to the SBLBB. Cost includes rock socku- stainless steel reinforcement (within drilled shaft only), epoxy reinf equipment mobilization and concrete. Cost derived from SBLBB increased by 16% as recommended by consumer price index.
4)	Item PERMANENT PATH APPROACH WORK carries cost for re approach work is structural.
5)	Dover approach bridge and elevated MSE wall path to be remove superstructure and existing abutment elevation (difference = 7.2'
6)	Unit cost of Item CONCRETE BRIDGE DECK (QC/QA) (F) is hig
Notes A)	Standard Contingency cost based on "Items Sub Total" Value
B)	Mobilization and Construction Inspection costs based on "Sub Tol
C)	Construction Engineering = 3.0% of "Total" value,
D)	Risk Contingency Cost is approximately = 7% of "Sui
E)	Total Cost is the sum of "Total", "Construction Engineering" and
F)	Vessel Collision loading/protection criteria is to be waived by the N
G)	Cultural Resource mitigation cost is not included in this conceptua

2.0 year assumed construction duration

\\/\/hb\gbl\prg\Bedford\52381.01\tech\Bridge\Cost EstImates - SEIS\Alternative 4\Alternative 4C - 16' Path - Conceptual EstImate\Alternative 4C - 16' Path - Conceptual EstImate

F) Vessel Collision loading/protection criteria is to be waived by the New Hampshire DOT, Bureau of Bridge Design

A) Standard Contingency cost based on "Items Sub Total" Value

C) Construction Engineering =

D) Risk Contingency Cost is approximately =

B) Mobilization and Construction Inspection costs based on "Sub Total" Value

G) Cultural Resource mitigation cost is not included in this conceptual estimate.

Notes:

3.50% of "Total" value, and is based on

E) Total Cost is the sum of "Total", "Construction Engineering" and "Risk Contingency" costs rounded to the nearest \$250,000

7% of "Sub Total" value

### eptual Cost Estimate

oject General Sullivan Bridge over Little Bay

ation Newington/Dover, NH

ed by MAC

ed by GSG

Alternative 6C

t Estimate - Alternative 6C

idening and Extended Substructure, 16' Multiuse Path Width

	Unit	Quantity		Unit Cost	Total Cost
ANS 1-4 & 6-9 (1253 LF)	U	1	\$	4,800,000	\$ 4,800,000
TIRE TRUSS	U	1	\$	1,100,000	\$ 1,100,000
ER 7 (PARTIAL)	U	- 1	\$	195,000	\$ 195,000
	U	1	\$	160,000	\$ 160,000
	EA	2	\$	650,000	\$ 1,300,000
	U	2	\$	250,000	\$ 500,000
	CY	120	\$	2,000	\$ 240,000
	CY	345	\$	2,000	\$ 690,000
	CY	980	\$	1,250	\$ 1,225,000
	LB	349,000	\$	1.50	\$ 523,500
	EA	7	\$	10,000.00	\$ 70,000
	EA	32	\$	5,000	\$ 160,000
	LB	1,325,828	\$	2.10	\$ 2,784,239
	LF	37	\$	100	\$ 3,700
	LF	37	\$	1,400	\$ 51,800
	LF	2,654	\$	300	\$ 796,302
	LF	3,381	\$	55	\$ 185,974
	LF	9,800	\$	175	\$ 1,715,000
	SF	6,739	\$	85	\$ 572,832
	LF	1,173	\$	390	\$ 457,470
DL - BRIDGE	LF	1,375	\$	45	\$ 61,875
	Ū –	1	\$	150,000	\$ 150,000
SE .	U	1	\$	700,000	\$ 700,000
	U	1	\$	180,000	\$ 180,000
Process of the second		- 1	ems	Sub Total	\$ 18,622,692
- SPANS 1-4 & 6-9 (1253		20% Standa	rd C	ontingency	\$ 3,724,538
ages of construction.				Sub Total	\$ 22,347,230
ENTIRE TRUSS cost		10	0% N	obilization	\$ 2,234,723
lvaged.		5% Constru	tion	Inspection	\$ 1,117,362
s a single drilled shaft ocket, shaft casing,				Total	\$ 25,699,315
einforcement, specialized		Constructi	on E	ngineering	\$ 770,979
BB bid tabulation and		Ris	sk Co	ontingency	\$ 1,500,000
		_U.	Т	otal Cost <sup>E</sup>	\$ 28,000,000

for required approach work behind the Newington abutment due to profile raise, Dover

noved and replaced due to significant grade differential of incoming proposed 7.2' +/-) due to maintaining 5% grade.

s higher than other alt's. due to more difficult deck forming off of SBLBB

Total" Value

alue, and is based on year assumed construction duration 1.5

"Sub Total" value

and "Risk Contingency" costs rounded to the nearest \$250,000

the New Hampshire DOT, Bureau of Bridge Design

eptual estimate.

xisting pier caps - needs further protection of existing structure consideration

//whb/gbl/proj/Bedford/52381.01/tech/Bridge/Cost Estimates + SEIS/Alternative 6/Alternative 6C - 16' Path - Conceptual Estimate/Alternative 6C - 16' Path - Conceptual Estimate

Project # 52381.01

Sheet Date 1/15/2019

#### Conceptual Cost Estimate

a 6 1

	Project General Sullivan Brid Location Newington/Dover, NH Calculated by MAC Reviewed by GSG				Project # Sheet	-	
	Calculated by MAC			-		1/1	5/2019
	Reviewed by GSG			÷ .			5/2019
	Title		Alternative 7	B	Dare		
	Conceptual Cost Estimate - Alternat	ive 7B	and and a		61. 1At 24		
	Independent Superstructure on Southbound Little Bay Bridge Extended S		e, 76 <i>Wuitiu</i> s	se Pa	th vviath		
ltem	CONCEPTUAL ESTIMATE OF QUANTITIES AN	D COST	ľ.	1	Unit		Total
No.	Item Description	Unit	Quantity	Cost			Cost
500	ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF)	U	1	\$	4,800,000	\$	4,800,00
502.01	SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS	Ŭ	1	\$	1,100,000	\$	1,100,00
502.02	SUBSTRUCTURE REMOVAL - ABUTMENTS, PIER 1, & PIER 7 (PARTIAL)	U	1	\$	195,000	\$	195,00
502.03	STRUCTURE REMOVAL - DOVER APPROACH BRIDGE	u	1	\$	160,000	\$	160,00
509	DRILLED SHAFT PIER, CAP AND REINFORCEMENT	EA	2	\$	650,000	\$	1,300,00
520	ABUTMENTS	U	2	\$	250,000	\$	500,00
520.01	CONCRETE CLASS AA - PRECAST PIER COLUMN	CY	120	\$	2,000	\$	240,00
520.02	CONCRETE CLASS AA - PIER CAP EXTENSION	CY	345	\$	2,000	\$	690,00
520.7002	CONCRETE BRIDGE DECK (QC/QA) (F)	CY	1,010	\$	1,150	\$	1,161,50
544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	357,000	\$	1.50	\$	535,50
548	PINNED BEARING FOR PIER EXTENSION COLUMNS	EA	7	\$	10,000.00	\$	70,00
548.21	ELASTOMERIC BEARING ASSEMBLIES (F)	EA	32	\$	5,000	\$	160,00
550.1	STRUCTURAL STEEL - WEATHERING (F)	LB	1,978,084	\$	2.10	\$	4,153,97
561.2	PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)	LF	37	\$	1,400	\$	51,80
563	PEDESTRIAN BRIDGE RAIL	LF	3,827	\$	300	\$	1,148,20
563.01	PROTECTIVE SCREENING	LF	1,691	\$	55	\$	92,98
571	REPOINT STONE MASONRY PIERS	LF	9.800	\$	175	\$	1,715,00
592	DOVER APPROACH MSE WALL	SF	6,739	\$	85	\$	572,83
506.41741	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - BRIDGE	LF	1,375	\$	45	\$	61.87
519.1	MAINTENANCE OF TRAFFIC	U	1	\$	150,000	\$	150.00
1002	TEMPORARY MULTI-USE PATH ON NB LITTLE BAY BRIDGE	U	1	\$	700,000	\$	700,00
1002	PERMANENT PATH APPROACH WORK	U	1 1	\$	180,000	\$	180,00
Major Assu	and the second sec	0		1.4	Sub Total	\$ \$	19,738,61
1)	Item ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SPANS 1-4 & 6-9 (1253 LF) is a causeway (460 LF) & trestle (793 LF) needed for all stages of construction.		20% Stand			\$ \$	3,947,73 23,686,40
2)	Item SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND ENTIRE TRUSS cost considers cost reduction due to no members needing to be salvaged.	10% Mobilization\$ 2,3685% Construction Inspection\$ 1,184					
3)	Item DRILLED SHAFT PIER, CAP AND REINFORCEMENT is a single drilled shaft pier of similar dimensions to the SBLBB. Cost includes rock socket, shaft casing, stainless steel reinforcement (within drilled shaft only), epoxy reinforcement, specialized		Construct	Tota Construction Engineering			27,239,36 817,18
	equipment mobilization and concrete. Cost derived from SBLBB bid tabulation and increased by 16% as recommended by consumer price index.		R	isk Co	ontingency	\$	1,500,00
	Rockersen V. G. Harris Association (Vision and Line agence			Ť	otal Cost <sup>E</sup>	\$	29,500,00
<b>4</b> )	Item PERMANENT PATH APPROACH WORK carries cost for required approach work b approach work is structural.	ehind the N	lewington abu	tm ent	due to profil	e rai	se, Dover
5)	Dover approach bridge and elevated MSE wall path to be removed and replaced due to superstructure and existing abutment elevation (difference = $7.2'$ +/-) due to maintaining 5		ade differentia	il of ir	icoming prop	osed	đ
6)	A minimum path width of 16' (18'-4" overall deck width) is recommended as the minimum limits defined by the AASHTO LRFD Manual; however there is concern from an engineeri path for this particular alternative.						
Notes A)	Standard Contingency cost based on "Items Sub Total" Value						
B)	Mobilization and Construction Inspection costs based on "Sub Total" Value						
C)	Construction Engineering = 3.0% of "Total" value, and is based on	1.5	year assur	ned c	onstruction c	urat	ion
D)	Risk Contingency Cost is approximately = 6% of "Sub Total" value						
E)	Total Cost is the sum of "Total", "Construction Engineering" and "Risk Contingency" cos	ts rounded	to the nearest	\$250	,000		
F)	Vessel Collision loading/protection criteria is to be waived by the New Hampshire DOT, B		2.m 2.2 2.3 2.0 m				
G)	Cultural Resource mitigation cost is not included in this conceptual estimate.						

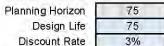
**Conceptual Cost Estimate** Project General Sullivan Bridge over Little Bay Project # 52381.01 Location Newington/Dover, NH Sheet Calculated by MAC Date 1/15/2019 Reviewed by GSG Date 1/15/2019 Title Alternative 9B Conceptual Cost Estimate - Alternative 9B Replacement of Existing General Sullivan Bridge Superstructure with "V-Shaped" Rigid Steel Frame Superstructure - 16'-0" Path CONCEPTUAL ESTIN Item Item Description No. ACCESS PLATFORM FOR BRIDGE CONSTRUCTION - SP 500 SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND EN 502.01 SUBSTRUCTURE REMOVAL - ABUTMENTS, & PIER 7 (PA 502.02 ABUTMENTS 520 520.12 CONCRETE CLASS A, ABOVE FOOTINGS (F) 520.7002 CONCRETE BRIDGE DECK (QC/QA) (F) 544.2 REINFORCING STEEL, EPOXY COATED (F) BEARING ASSEMBLIES 548 550.1 STRUCTURAL STEEL - WEATHERING (F) 550.9 STRUCTURAL STEEL - METALIZED & COLORED (LEGS C 561.2 PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F) PEDESTRIAN BRIDGE RAIL 563 571 REPOINT STONE MASONRY PIERS 1002 TEMPORARY MULTI-USE PATH ON NB LITTLE BAY BRID 1003 PERMANENT PATH APPROACH WORK Major Assumptions: 1) Item ACCESS PLATFORM FOR BRIDGE CONSTRUCTION LF) is a causeway (460 LF) & trestle (793 LF) needed for all s 2) Item SUPERSTRUCTURE REMOVAL - DECK SYSTEM AND considers cost reduction due to no members needing to be sa 3) Item SUBSTRUCTURE REMOVAL - ABUTMENTS & PIER 7 removal of both abutments, and the top portion of Pier 7. 4) Item PERMANENT PATH APPROACH WORK carries cost for Newington abutment - no work anticipated behind the Dover a 5) Life cycle costs are NOT included in this estimate. 6) A minimum path width of 16' (18'-4" overall deck width) is reco witdth. A 12' path technically meets aeroelastic instability limit LRFD Manual; however there is concern from an engineering anything narrower than the 16' path for this particular alternati Notes: A) Standard Contingency cost based on "Items Sub Total" Value B) Mobilization and Construction Inspection costs based on "Sub Total" Value C) Construction Engineering = 3.0% of "Total" value, and is based on 1.5 year assumed construction duration D) Risk Contingency Cost is approximately = 5% of "Sub Total" value E) Total Cost is the sum of "Total", "Construction Engineering" and "Risk Contingency" costs rounded to the nearest \$250,000 F) Vessel Collision loading/protection criteria is to be waived by the New Hampshire DOT, Bureau of Bridge Design G) Cultural Resource mitigation cost is not included in this conceptual estimate.

//vhb/gb/pro//Bedford/52381.01/tech/Bridge/Cost Estimates - SEIS/Alternative 9(Alternative 9B - 16' Path - Conceptual Estimate/Alternative 9B - 16' Path - Conceptual Estimate

//vhb/gbl/proj/Bedford/52381.01/tech/Bridge/Cost Estimates - SEIS/Alternative 7/Alternative 7B - 16' Path - Conceptual Estimate

Unit	Quantity	T,	Unit Cost		Total Cost
U	1	\$	4,800,000	\$	4,800,000
U	1	\$	1,100,000	\$	1,100,000
U	1	\$	100,000	\$	100,000
U	2	\$	250,000	\$	500,000
CY	120	\$	1,300	\$	156,000
CY	930	\$	1,150	\$	1,069,500
LB	263,000	\$	1.50	\$	394,500
EA	30	\$	5,000	\$	150,000
LB	2,330,000	\$	3.00	\$	6,990,000
SF	26,000	\$	13.50	\$	351,000
LF	37	\$	1,400	\$	51,800
LF	3,056	\$	300	\$	916,800
LF	11,200	\$	175	\$	1,960,000
U		\$	700,000	\$	700,000
U	1	\$	10,000	\$	10.000
0		φ	10,000	Þ	10,000
1 0		10.00	Sub Total	۶ ۶	
1.0		ems	Sub Total	1.12.1	19,249,600
1 0	lt	ems	Sub Total	\$	10,000 19,249,600 3,849,920 23,099,520
	/t 20% Standa	ems rd C	Sub Total ontingency Sub Total	\$ \$ \$	19,249,600 3,849,920 23,099,520
	<i>it</i> 20% Standar 10	rd C	Sub Total ontingency Sub Total Aobilization	\$ \$ \$ \$ \$	19,249,600 3,849,920 23,099,520 2,309,952
	/t 20% Standa	rd C	Sub Total ontingency Sub Total Aobilization	\$ \$ \$	19,249,600 3,849,920 23,099,520
	<i>it</i> 20% Standar 10	rd C 9% N	Sub Total ontingency Sub Total Iobilization Inspection Total	\$ \$ \$ \$ \$	19,249,600 3,849,920 23,099,520 2,309,952 1,154,976
	It 20% Standau 10 5% Construction Construction	rd C nd C )% M ction	Sub Total ontingency Sub Total Iobilization Inspection Total	\$ \$ \$ \$ \$ \$	19,249,600 3,849,920 23,099,520 2,309,952 1,154,976 26,564,448
	U U CY CY LB EA LB SF LF LF LF LF U	U         1           U         1           U         2           CY         120           CY         930           LB         263,000           EA         30           LB         2,330,000           SF         26,000           LF         37           LF         3,056           LF         11,200           U         1	U         1         \$           U         1         \$           U         2         \$           CY         120         \$           CY         930         \$           LB         263,000         \$           EA         30         \$           LB         2,330,000         \$           SF         26,000         \$           LF         37         \$           LF         3,056         \$           LF         11,200         \$           U         1         \$	U         1         \$         1,100,000           U         1         \$         100,000           U         2         \$         250,000           CY         120         \$         1,300           CY         930         \$         1,150           LB         263,000         \$         1.50           EA         30         \$         5,000           LB         2,330,000         \$         3.00           SF         26,000         \$         13.50           LF         37         \$         1,400           LF         3,056         \$         300           LF         11,200         \$         175           U         1         \$         700,000	U         1         \$         1,100,000         \$           U         1         \$         100,000         \$           U         2         \$         250,000         \$           CY         120         \$         1,300         \$           CY         930         \$         1,150         \$           LB         263,000         \$         1.50         \$           EA         30         \$         5,000         \$           LB         2,330,000         \$         3.00         \$           SF         26,000         \$         13.50         \$           LF         3,7         \$         1,400         \$           LF         3,056         \$         300         \$           LF         11,200         \$         175         \$           U         1         \$         700,000         \$

#### Life Cycle Cost Analysis:

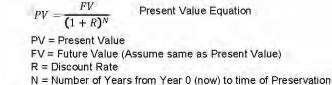


Years

Years

Alternative Cost Sum	nary:
Initial Capital Cost	\$43,000,000
Total Cost - Constant Year	\$74,000,000
Total Cost - Present Value	\$52,500,000

Fiscal planning time span for the General Sullivan Bridge Project Anticipated useful life of bridge before major repair/replacement Typically between 3% and 5% per FHWA LCCA Primer



Work

	Cost per	C		A		Sub-Total Cost:	Sub-Total Cost:							
Preservation Item During Service Life:	Occurrence	Interval <sup>5</sup>	1st	2nd	3rd	4th	5th	edule (Years 6th	7th	8th	9th	10th	Constant Year	Present Value
Maintenance - Clean Deck, Joints, Piers and Drainage Systems	\$6,550	1		1 (1 <del>1</del> )	1.14	1	1	8	1	1.0	~	1.0	\$491,250	\$194,547
Coating System - Touch-Up Painting	\$2,238,920	- 20	20	st <del>e</del> r (	-	100	100	-	1	-		- <del>-</del>	\$2,238,920	\$1,239,636
Coating System - Maintenance Repaint (Overcoat)	\$3,918,110	- 19	27			-	-			-	-	- 15	\$3,918,110	\$1,763,890
Coating System - Abrasive Blast Clean and Paint	\$7,556,355		37	104-	~	4	10 ÷		- 64				\$7,556,355	\$2,531,250
Coating System - Touch-Up Painting	\$3,022,542	103401	57	i decim	0.41	÷	i desan	÷	1 - S 1	L I CEL	In Rect		\$3,022,542	\$560,597
Coating System - Maintenance Repaint (Overcoat)	\$5,289,449	1.2.2.4	64	1. C <del>1</del> (1. 1	100-00-	10.0	10 e -	- 38-4		1 Heger I	1-0-3-C1	HO-INC	\$5,289,449	\$797,679
Coating System - Touch-Up Painting <sup>7</sup>	\$3,022,542		74		100	÷	1.2		~	-	~	-	\$3,022,542	\$339,170
Detailed Bridge Inspection and Maintenance	\$151,000	3			-		-	~		-	-	Æ	\$3,775,000	\$1,451,026
Joints - Replacement	\$110,880	1.1	25	50	1-20	1.00	-			124	11-2.01	1 - C - 1	\$221,760	\$78,249
Concrete Deck - Rehabilitation	\$174,997		50	1.	4	4	4		105.00	÷	-	-	\$174,997	\$39,918
Piers - Repointing	\$635,250	Dec.	25	50	the second		in ș	문문		n në e c	1.1.4	152-1	\$1,270,500	\$448,304
Residual Value	\$0		75	a Ditest	27 <del>.</del> 27	ta esta a	12 ÷		1281	1.000	1.00		\$0	\$0
					_		A.					Total	\$30,981,425	\$9,444,266
												Say	\$31,000,000	\$9,500,000

#### Notes/Assumptions:

1) "Initial Capital Cost" is the cost in todays dollars to perform all work necessary to bring the proposed alternative structure into initial Service.

- 2) "Constant Year" is the cost in todays dollars assuming no annual discount of Preservation Work.
- 3) "Present Value" is the cost in todays dollars assuming an annual discount at the assumed "Discount Rate" from year 0 until the year the Preservation Work is performed.
- 4) "Cost per Occurrence" is the cost in todays dollars to complete the item of Preservation Work one time.
- 5) "Interval" is used for preservation work items that occur on a regular basis (Examples: Annually = 1, Bi-Annually = 2, Every Five Years = 5)
- 6) "Residual Value" calculates the value of the remaining design life of the structure based on the Planning Horizon
- 7) A full blast and recoat at year 74 is recomended by KTA Tator if the structure is planned to stay in service beyond 75 years. The planned design life is 75 years; however it is anticipated that the bridge will stay in active service for several years after the planned design life while replacement decisions and new structure design are completed. Therefore, it is reasonable to account for a coating maintenance cost to keep the bridge safe service during this anticipated planning period.

Item Cost Calculations:

#### Project General Sullivan Bridge over Little Bay

Location Newington/Dover, NH

Calculated by MAC

Reviewed By GSG

Title

Alternative 1D

Present Value Equation

Project # 52381.01 Sheet Date 1/15/2019

Years

Years

#### Life Cycle Cost Analysis:



Alternative Cost Sum	nary:
Initial Capital Cost	\$42,250,000
Total Cost - Constant Year	\$61,750,000
Total Cost - Present Value	\$48,000,000

Fiscal planning time span for the General Sullivan Bridge Project Anticipated useful life of bridge before major repair/replacement Typically between 3% and 5% per FHWA LCCA Primer

$PV = \frac{FV}{(1+R)^N}$
and the second se
PV = Present Value
FV = Future Value (A
R = Discount Rate
N = Number of Years

Work

Deserve of the Develop Develop ( if a	Cost per					Sub-Total Cost:	Sub-Total Cost:							
Preservation Item During Service Life:	Occurrence	Interval <sup>5</sup>	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Constant Year	Present Value
Naintenance - Clean Deck, Joints, Piers and Drainage Systems	\$6,550	TT T	100		0	0	- 7	1.281	124.14	- <i>18</i> a	181	10 T 😤 Terri	\$491,250	\$194,547
Coating System - Touch-Up Painting <sup>7</sup>	\$1,182,280	1.2.4	20		;->	- 39		*		- ~	141		\$1,182,280	\$654,600
Coating System - Maintenance Repaint (Overcoat) <sup>7</sup>	\$2,068,990	12+01	27	-	- 9	- 51	~	- 8	~	- 8	3	×	\$2,068,990	\$931,437
Coating System - Abrasive Blast Clean and Paint <sup>7</sup>	\$3,990,195	10.001	37	÷	(H)	- 8	- 03	- 23	181				\$3,990,195	\$1,336,647
Coating System - Touch-Up Painting <sup>7</sup>	\$1,596,078	i neci	57	÷					080	i sant		201	\$1,596,078	\$296,028
Coating System - Maintenance Repaint (Overcoat) <sup>7</sup>	\$2,793,137	1000	64				1.04	-8-			¥.		\$2,793,137	\$421,221
Coating System - Touch-Up Painting <sup>7</sup>	\$1,596,078	17.00	74	- 40	>>	-1	3-6	<u> </u>	$\sim$	- 60	÷.	÷.,	\$1,596,078	\$179,102
Coating System - Metalizing Removal and Recoat	\$1,863,000	100-201	50	- 42	->	-		- 10 M	100	- '&"	÷.	$ 1\rangle \to \int_{-\infty}^{\infty} dx^{-1} (x) = \int_{-\infty}^{\infty} dx^{-1} (x) (x) = \int_{-\infty}^{\infty} dx^{-1} (x) (x) (x) (x) (x) (x) (x) (x) (x) (x)$	\$1,863,000	\$424,963
Detailed Bridge Inspection	\$87,000	3	4	-	-		~	- <del></del>	~	÷	×	1 - P	\$2,175,000	\$836,022
Joints - Replacement	\$143,088	119-1	25	50	÷.	8-1	÷.	÷	Ŧ	-	a.	1.18	\$286,176	\$100,979
Concrete Deck - Rehabilitation	\$174,997	Lize-Ca	50			1.64.1	лён (	÷		- ÷	ся.		\$174,997	\$39,918
Piers - Repointing	\$635,250	i i interació	25	50	÷ .			13					\$1,270,500	\$448,304
Residual Value	\$0	1	75	÷				- 8 -	- 8-				\$0	\$0
Assumptions:		-									-	Total	\$19,487,681	\$5,863,767
nitial Capital Cost" is the cost in todays dollars to perform all work necess	and to have a the surger and a		4									Say	\$19,500,000	\$5,750,000

Note

2) "Constant Year" is the cost in todays dollars assuming no annual discount of Preservation Work.

3) "Present Value" is the cost in todays dollars assuming an annual discount at the assumed "Discount Rate" from year 0 until the year the Preservation Work is performed.

4) "Cost per Occurrence" is the cost in todays dollars to complete the item of Preservation Work one time.

5) "Interval" is used for preservation work items that occur on a regular basis (Examples: Annually = 1, Bi-Annually = 2, Every Five Years = 5)

6) "Residual Value" calculates the value of the remaining design life of the structure based on the Planning Horizon

7) Painting operations pertain to middle three spans only.

8) At the end of the planning horizon, assume the entire structure will be replaced with a similar truss (alt 2). It is not reasonable to assume replacing only the middle three spans with a new structure, adjacent to 75 year old approach span trusses. It would be logical to replace the entire bridge since removal and access costs are a large portion of the capital cost for any kind of replacement; and the expectation after such expenditure would be to not touch the bridge again for a long period of time and without rigorous maintenance.

Calculated by MAC Reviewed By GSG

#### Project General Sullivan Bridge over Little Bay

Location Newington/Dover, NH

Title

Alternative 3C

Present Value Equation

alue (Assume same as Present Value)

of Years from Year 0 (now) to time of Preservation

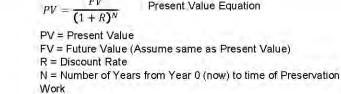
Project # 52381.01 Sheet Date 1/15/2019

#### Life Cycle Cost Analysis:



Alternative Cost Sum	nary:
Initial Capital Cost	\$28,000,000
Total Cost - Constant Year	\$31,250,000
Total Cost - Present Value	\$29,250,000

Fiscal planning time span for the General Sullivan Bridge Project Anticipated useful life of bridge before major repair/replacement Typically between 3% and 5% per FHWA LCCA Primer



FV

Preservation Item During Service Life:	Cost per	1			Sub-Total Cost:	Sub-Total Cost.								
	Occurrence	Interval <sup>5</sup>	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Constant Year	Present Value
Maintenance - Clean Deck, Joints, Piers and Drainage Systems	\$6,550	1	1	(	0.0000	- 75	- 77.14	- 21-	142	14.5		- 12 -	\$491,250	\$194,547
Coating System - Touch-Up Painting <sup>7</sup>	\$304,000	12.00	25	50	75	3-34	3-6		~	8		-	\$912,000	\$247,656
Routine Bridge Inspection	\$17,000	2		294			-		~		-	4.0	\$629,000	\$247,822
loints - Replacement	\$73,260	-	25	50	75	2	-					-	\$219,780	\$59,682
Concrete Deck - Rehabilitation	\$399,515	1047.0	50	i - 360 il	i retni	inst i			0801	80	1080	1	\$399,515	\$91,132
Pier Column Bearings - Replacement	\$134,750	1000	50		- ÷	- E +		- 33 al	1.28	1-82	1.5		\$134,750	\$30,737
Concrete Barrier - Double Faced	\$82,436	12.00	25	50			~	~	~		~	$\sim$	\$164,872	\$58,176
Protective Screening	\$17,742		25	50		-		-	-			-	\$35,483	\$12,520
Piers - Repointing	\$635,250	1.000	25	50	75		2-1	-		- 8	4-0	- 4c	\$1,905,750	\$517,511
Residual Value	-\$1,750,000	÷	75			41	1.20		1.141	1234		12 y 1	-\$1,750,000	-\$190,654
												Total	\$3,142,400	\$1,269,130
												Say	\$3,250,000	\$1,250,000

#### Notes/Assumptions:

1) "Initial Capital Cost" is the cost in todays dollars to perform all work necessary to bring the proposed alternative structure into initial Service.

2) "Constant Year" is the cost in todays dollars assuming no annual discount of Preservation Work.

3) "Present Value" is the cost in todays dollars assuming an annual discount at the assumed "Discount Rate" from year 0 until the year the Preservation Work is performed.

4) "Cost per Occurrence" is the cost in todays dollars to complete the item of Preservation Work one time.

5) "Interval" is used for preservation work items that occur on a regular basis (Examples: Annually = 1, Bi-Annually = 2, Every Five Years = 5)

6) "Residual Value" calculates the value of the remaining design life of the structure based on the Planning Horizon

7) Assume 2/3 the cost of Alternative 2 for touch-up painting. Paint is only in vicinity of Joints since girders are weathering steel, and alternative 6 has four joints as opposed to six joints as in alternative 2.

Item Cost Calculations:

\\vhb\gbl\proj\Bedford\52381.01\tech\Bridge\Cost Estimates - SEIS\Alternative 6\Alternative 6C - 16' Path - Conceptual Estimate

#### Project General Sullivan Bridge over Little Bay

Location Newington/Dover, NH

Calculated by MAC

Reviewed By GSG

Title

Alternative 6C

Present Value Equation

Project # 52381.01 Sheet Date 1/15/2019

## Computations Life Cycle Cost Analysis:



Years

Years

Alternative Cost Summary:						
Initial Capital Cost	\$29,500,000					
Total Cost - Constant Year	\$32,250,000					
Total Cost - Present Value	\$30,750,000					

Fiscal planning time span for the General Sullivan Bridge Project Anticipated useful life of bridge before major repair/replacement Typically between 3% and 5% per FHWA LCCA Primer

FV $PV = \frac{1}{(1+R)^N}$ PV = Present Value FV = Future Value (Assume same as Present Value) R = Discount Rate

Work

Life Cycle Cost Analysis and Breakdown Cost per Preservation Work Schedule (Years) Preservation Item During Service Life: Occurrence Interval<sup>5</sup> 1st 2nd 3rd 4th 5th 6th 7th 8th 9th Maintenance - Clean Deck, Joints, Piers and Drainage Systems \$6,550 1 14 -1 120 ~ 2 1  $\mathbf{H}$ 75 Coating System - Touch-Up Painting<sup>7</sup> \$304,000 25 50 1 -3-1 -- $\sim$ (-1)Routine Bridge Inspection \$17,000 2 20 ----1-1 -\$68,376 25 50 75 Joints - Replacement 1.21 ÷. 4 --4 20 Concrete Deck - Rehabilitation \$193,592 50 141 --- 21 + 141 14 14 1 Pier Column Bearings - Replacement \$134,750 50 ..... 141 140 . 1 ---1. Piers - Repointing \$635,250 25 50 75 1.0 - $\sim$  $\sim$ 1 1  $\sim$ **Residual Value** -\$1,843,750 75 1.4 140 -1 1.40 1-1 1 1

#### Notes/Assumptions:

1) "Initial Capital Cost" is the cost in todays dollars to perform all work necessary to bring the proposed alternative structure into initial Service.

2) "Constant Year" is the cost in todays dollars assuming no annual discount of Preservation Work.

3) "Present Value" is the cost in todays dollars assuming an annual discount at the assumed "Discount Rate" from year 0 until the year the Preservation Work is performed.

4) "Cost per Occurrence" is the cost in todays dollars to complete the item of Preservation Work one time.

5) "Interval" is used for preservation work items that occur on a regular basis (Examples: Annually = 1, Bi-Annually = 2, Every Five Years = 5)

6) "Residual Value" calculates the value of the remaining design life of the structure based on the Planning Horizon

7) Assume 2/3 the cost of Alternative 2 for touch-up painting. Paint is only in vicinity of Joints since girders are weathering steel, and alternative 7 has four joints as opposed to six joints as in alternative 2.

Item Cost Calculations:

\\vhb\gbl\proj\Bedford\52381.01\tech\Bridge\Cost Estimates - SEIS\Alternative 7\Alternative 7B - 16' Path - Conceptual Estimate

#### Project General Sullivan Bridge over Little Bay

Location Newington/Dover, NH

Calculated by MAC

Reviewed By GSG

Title

Alternative 7B

Present Value Equation

N = Number of Years from Year 0 (now) to time of Preservation

10th	Sub-Total Cost: Constant Year	Sub-Total Cost Present Value					
2	\$491,250	\$194,547					
44	\$912,000	\$247,656					
-	\$629,000	\$247,822					
	\$205,128	\$55,703 \$44,160					
3	\$193,592						
4	\$134,750	\$30,737					
~	\$1,905,750	\$517,511					
-	-\$1,843,750	-\$200,868					
Total	\$2,627,720	\$1,137,269					
Say	\$2,750,000	\$1,250,000					

Project # 52381.01 Sheet

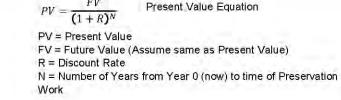
Date 1/15/2019 Date 1/15/2019

#### Life Cycle Cost Analysis:



Alternative Cost Sum	mary:
Initial Capital Cost	\$28,500,000
Total Cost - Constant Year	\$31,250,000
Total Cost - Present Value	\$29,750,000

Fiscal planning time span for the General Sullivan Bridge Project Anticipated useful life of bridge before major repair/replacement Typically between 3% and 5% per FHWA LCCA Primer



FV

Preservation Item During Service Life:	Cost per	Preservation Work Schedule (Years)											Sub-Total Cost:	Sub-Total Cost:
	Occurrence	Interval <sup>5</sup>	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Constant Year	Present Value
Maintenance - Clean Deck, Joints, Piers and Drainage Systems	\$6,550	1	9	1. THE -	1. C.C.	- r.	-141		1.1		180	9	\$491,250	\$194,547
Coating System - Touch-Up Painting <sup>7</sup>	\$152,000	-	25	50	75	-	.e.	- A	÷.	×.		1	\$456,000	\$123,828
Coating System - Metalizing Removal and Recoat	\$702,000	12-01	50		2		3-6		-				\$702,000	\$160,131
Routine Bridge Inspection	\$17,000	2	4	24	J.	-	-	-Ac	1990 -	-Ac		-	\$629,000	\$247,822
Joints - Replacement	\$68,376	i instant	25	50	75	1 (s. 1		94) (4)	+C	- 8	0.00	а. С	\$205,128	\$55,703
Concrete Deck - Rehabilitation	\$174,965	1.11.4	50					*	0.0				\$174,965	\$39,911
Piers - Repointing	\$635,250		25	50	75	~		~		~	~		\$1,905,750	\$517,511
Residual Value	-\$1,781,250		75	21	î.		200	$\times$	$\times$	~	1-1	÷.,	-\$1,781,250	-\$194,059
		0									1	Total	\$2,782,843	\$1,145,395
												Say	\$2,750,000	\$1,250,000

#### Notes/Assumptions:

1) "Initial Capital Cost" is the cost in todays dollars to perform all work necessary to bring the proposed alternative structure into initial Service.

2) "Constant Year" is the cost in todays dollars assuming no annual discount of Preservation Work.

3) "Present Value" is the cost in todays dollars assuming an annual discount at the assumed "Discount Rate" from year 0 until the year the Preservation Work is performed.

4) "Cost per Occurrence" is the cost in todays dollars to complete the item of Preservation Work one time.

5) "Interval" is used for preservation work items that occur on a regular basis (Examples: Annually = 1, Bi-Annually = 2, Every Five Years = 5)

6) "Residual Value" calculates the value of the remaining design life of the structure based on the Planning Horizon

7) Assume 1/3 the cost of Alternative 2 for touch-up painting. Paint is only in vicinity of Joints since girders are weathering steel, and alternative 9 has two joints as opposed to six joints as in alternative 2.

#### Project General Sullivan Bridge over Little Bay

Location Newington/Dover, NH

Calculated by MAC

Reviewed By GSG

Title

Alternative 9B

Present Value Equation

Project # 52381.01 Sheet

Date 1/15/2019 Date 1/15/2019