



MEMORANDUM

TO: Matthew Langhorst, Assistant City Engineer - City of Glenwood Springs

FROM: Ron Nies, PE - SGM Roadway Engineer

DATE: April 18, 2018

RE: **South Midland Avenue Reconstruction Project
Summary of Typical Section Options 3A and 3B**

Purpose of Memorandum

This memorandum provides a description of two typical section options for the reconstruction of S. Midland Avenue. These two options were created as alternatives to the Base Option typical section and were used to determine the minimum platform width needed to construct a typical section while providing two-way traffic during construction.

A Phasing Typical Section Plan sheet is provided with this memo for each option for reference.

Typical Section Development Background

The total proposed width of the **Base Option Typical Section** for Midland Avenue is 46'. This typical section option includes a 6' sidewalk, 3' buffer area for guardrail, 2-11' thru lanes with 2.5' gutters and curbing on both lanes, and a 10' rock catchment/drainage area. For the project segment from Hager Lane to Old Cardiff Bridge Road, the existing platform on which Midland Avenue is situated is approximately 38'. "Platform" for the purposes of this memo means the width from the top of slope on the east side of the road to the bottom of the cut slope on the west side of the road. A proposed construction phasing of the Base Option was presented in the Preliminary Design Plans and showed how the 46' wide proposed section was to be constructed from the 38' existing platform.

The City asked SGM to develop a **Reduced Typical Section** that provided certain cross-sectional elements, but was narrower than the Base Option, and also reduced the downhill block wall length as much as possible*. The Reduced Typical Section selected is as follows:

- One 12' (NB) and one 11' (SB) lane
- Curb and gutter on southbound lane only (2.5' width)
- Type 3 guardrail for shielding the downhill slope (3' total width used)
- Minimum of a 10' catchment area

The total width for this typical section is 38.5.'

SGM then was to determine what the **minimum** platform width would be to construct a reduced width typical section and still meet the Constructability Requirements that are defined below. The results of this exercise are typical section Options 3A and 3B.

Constructability Requirements

SGM used the input of an experienced, local contractor to determine minimum requirements for construction work zones for the Midland Avenue reconstruction.

These requirements are as follows:

- Minimum work zone width of 14'
- Two-way traffic during construction is required for accessing the work site
- A minimum traffic lane width of 10'
- Concrete barriers required separating the work area from active traffic lanes

Based on these parameters, SGM determined that the 38.5' Reduced Typical Section is not constructible and that a minimum proposed platform of 43' is required.

Option 3A Description and Typical Section Elements

Option 3A is a typical section option with a total width of 43' that meets all the minimum constructability requirements. The **Option 3A Typical Section** elements are as follows:

- Two 12' lanes
- Curb and gutter on southbound lane only (2.5' width)
- Type 3 guardrail for shielding the downhill slope (3' total width used)
- 13' catchment area and 0.5' wall facing

This typical section option adds an extra 1' of pavement width and 3.5' of catchment width to the Reduced Typical Section. The extra pavement width is needed to increase the distance between guardrail and curb face to meet the constructability requirements.

Option 3B Description and Typical Section Elements

Since extra width in the catchment area is not required and is unusable space, Option 3B moved the extra catchment width to pavement width in order to create possible shoulders, bike lanes, or wider traffic lanes. Total width remained at 43'. The **Option 3B Typical Section** elements are as follows:

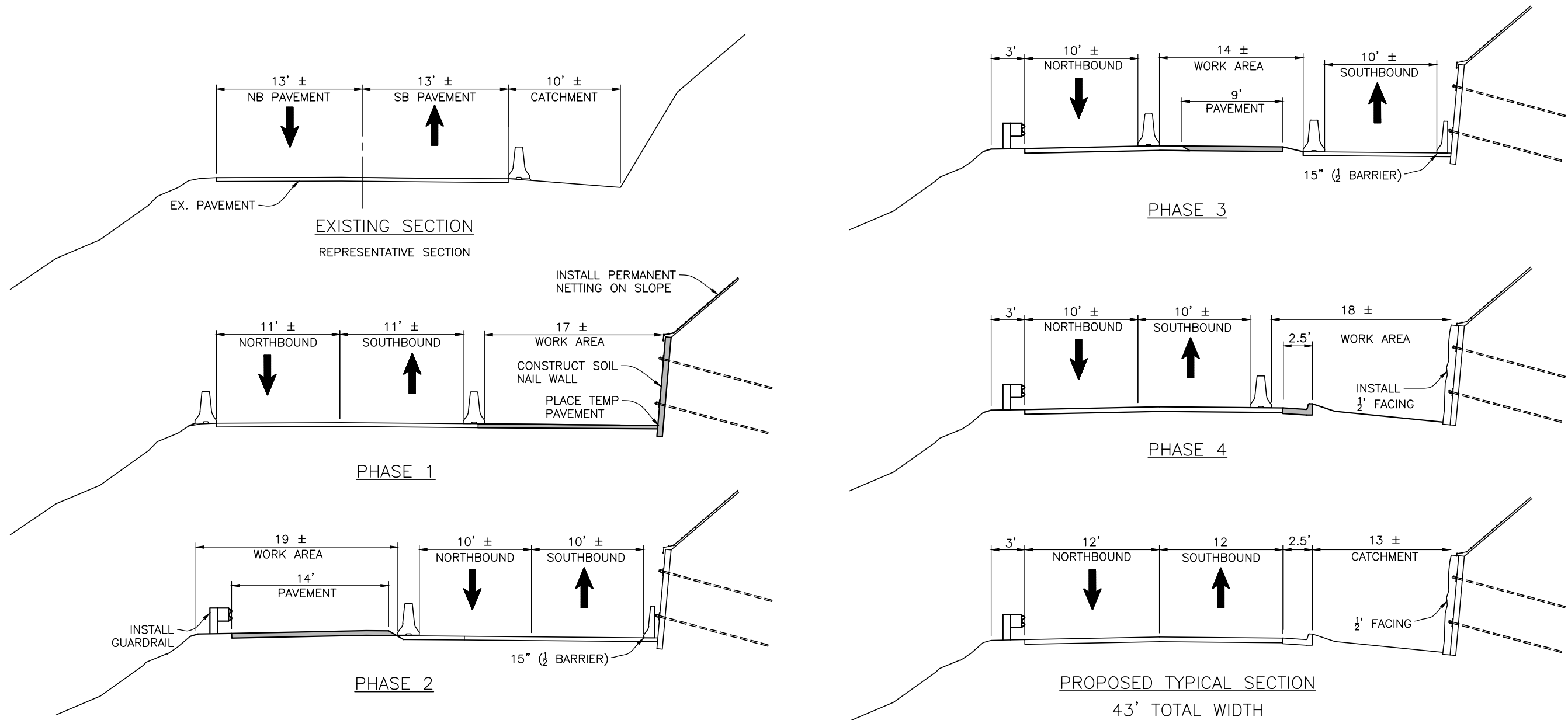
- Two 12' lanes
- 3' extra pavement width
- Curb and gutter on southbound lane only (2.5' width)
- Type 3 guardrail for shielding the downhill slope (3' total width used)
- 10' catchment area and 0.5' wall facing

Summary

SGM has determined that a 43' wide Midland Avenue typical section is the minimum that can be constructed in a safe and efficient manner. Narrower typical sections are not constructible based on normal construction practices and equipment. Options exist for how the 43' width is best utilized.

* Downhill block wall is still needed for all options at the narrowest segment of the project located at the Haycock property

I:\2017\2017-211-GWSSOMIDLAND\001-MIDLAND4MILE\RD27TH\T-H-DWGS\CIVIL\MISC\DWGS\CONSTRUCTION\PHASING-OPTIONS.DWG Plotted: 4/12/2018 3:15 PM By: Ashley Cline



MIDLAND AVE. CROSS SECTION
OPTION 3A: TWO-WAY TRAFFIC DURING CONSTRUCTION
(EXTRA CATCHMENT WIDTH)
 SCALE: 1" = 10'

Computer File Information	
Print Date:	4/12/18
Last Modification Date:	1/18/2018
Drawing File Name:	ConstructionPhasing-Options
Autocad Ver.:	2018
Scale:	As Shown
Units:	English
SGM Project No.:	2017-211.001
Quality Control:	RLM

Sheet Revisions				
Rev.	Date	Comments	Init.	
1				



As Constructed	
No Revisions:	-
Revised:	-
Void:	-

South Midland Ave. Improvements Construction Phasing Typical Sections			
Engineer:	MDF	Structure	--
Drawn By:	AMC	Numbers	--
Sheet Subset:	Const. Phasing	Subset Sheets:	1 of -

Project No./Code	
No.:	---
Code:	--
Sheet Number:	36

ENGINEER'S OPINION OF PROBABLE COST (EOPC)



PROJECT: South Midland Avenue - Option 3A- 43' total width; 13' catchment width
SGM NO.: 2017-211.001
DATE: 4/18/2018
EOPC LEVEL: Post - 30% Design
PREPARED BY: Ron Nies
REVIEWED BY:

ROADWAY CONSTRUCTION ITEMS	ESTIMATED COST	% OF (a)
Removals and Resets	\$ 464,500	7.1%
Earthwork (Excavation, Embankment)	\$ 340,000	5.2%
Erosion Control	\$ 194,500	3.0%
Surfacing (Base Course, Pavement, C & G, Sidewalk)	\$ 2,359,000	36.3%
Roadway (Guardrail, Fence)	\$ 141,000	2.2%
Drainage (Pipes, Inlets, Manholes)	\$ 692,500	10.6%
Retaining Walls (Block Wall, Soil Nail Wall)	\$ 1,360,000	20.9%
Rockfall Mitigation (Mesh above Walls)	\$ 370,500	5.7%
Traffic Control during Construction	\$ 528,500	8.1%
Signing and Striping	\$ 53,000	0.8%
Force Accounts (Incentives, MCRs)	\$ -	0.0%
SUBTOTAL OF CONSTRUCTION ITEMS:	\$ 6,503,500 (a)	

OTHER PROJECT COSTS	ESTIMATED COST	% OF (a)
Contingency (Final Design Items, Phased Const.)	\$ 975,500	15.0%
Mobilization	\$ 390,000	6.0%
Lighting	\$ 99,500	1.5%
Utilities (Electrical)	\$ 70,500	1.1%
Landscaping	\$ -	0.0%
Construction Surveying	\$ 65,000	1.0%
Construction Management (Inspection & Testing)	\$ 325,000	5.0%
SUBTOTAL OF OTHER PROJECT COSTS:	\$ 1,925,500 (b)	

ENGINEER'S OPINION OF TOTAL PROJECT COSTS (a) + (b):	\$8,429,000
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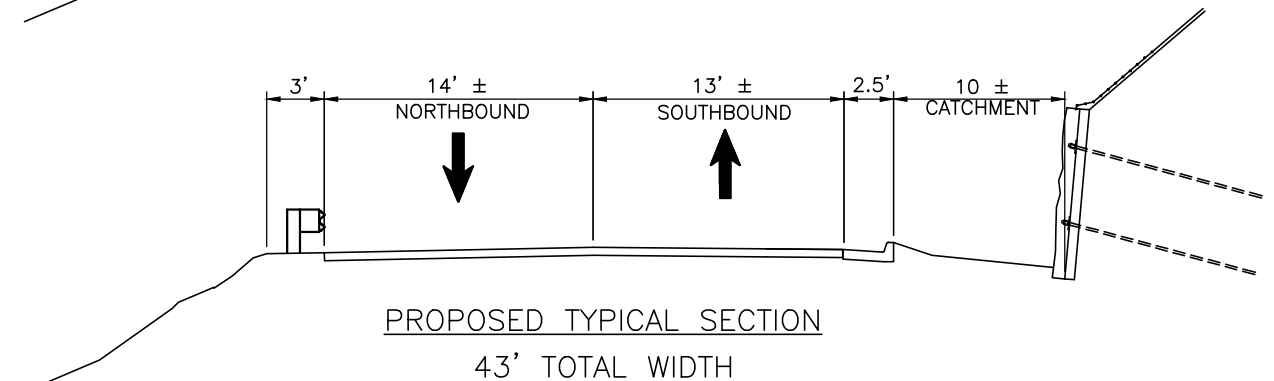
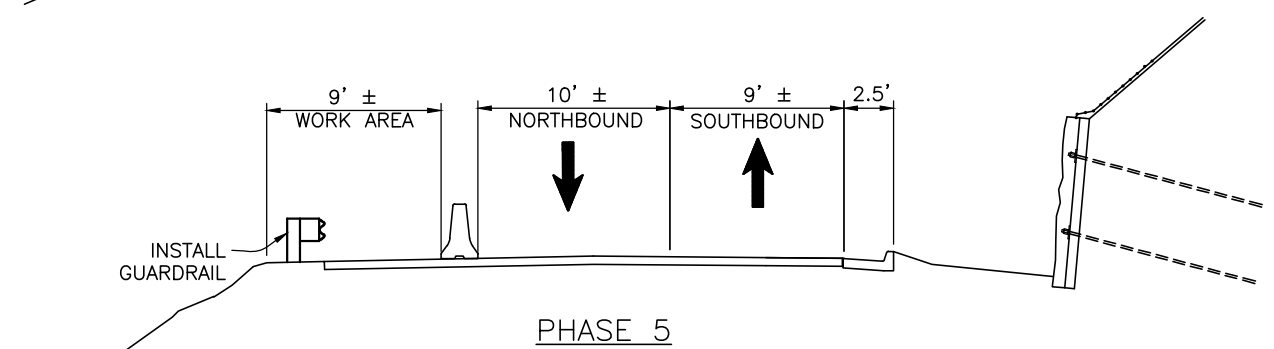
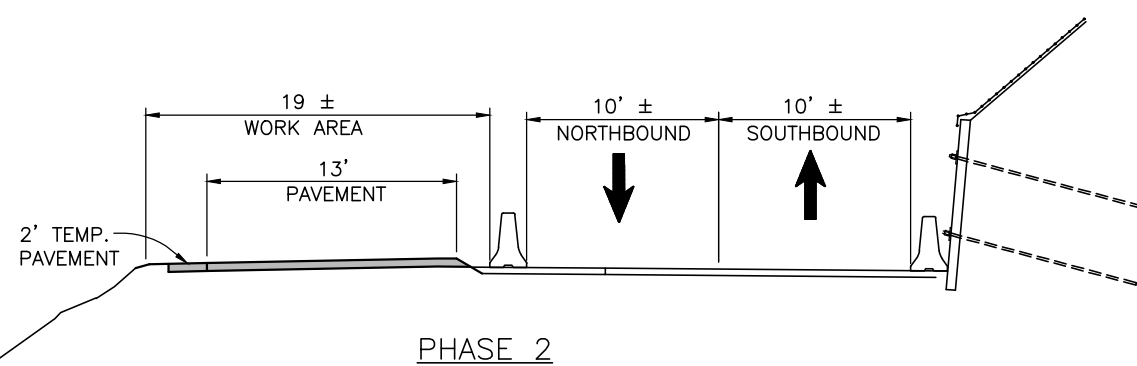
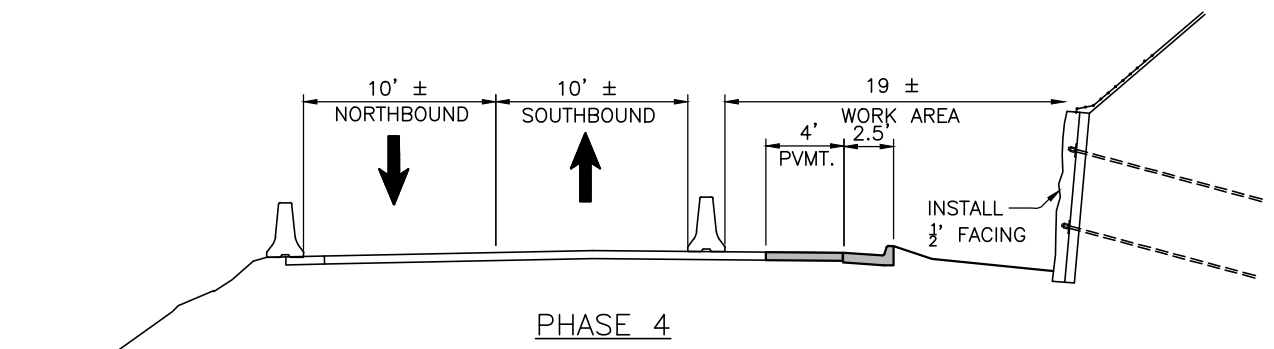
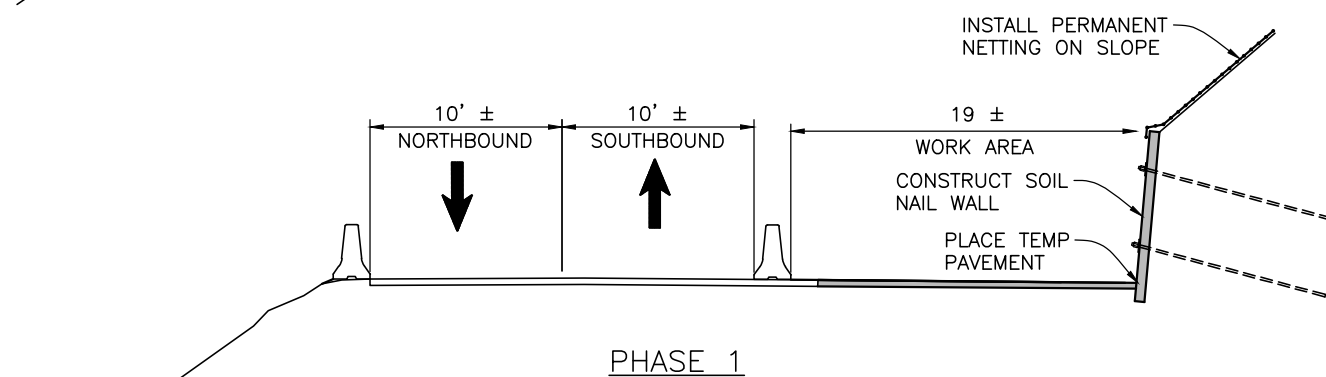
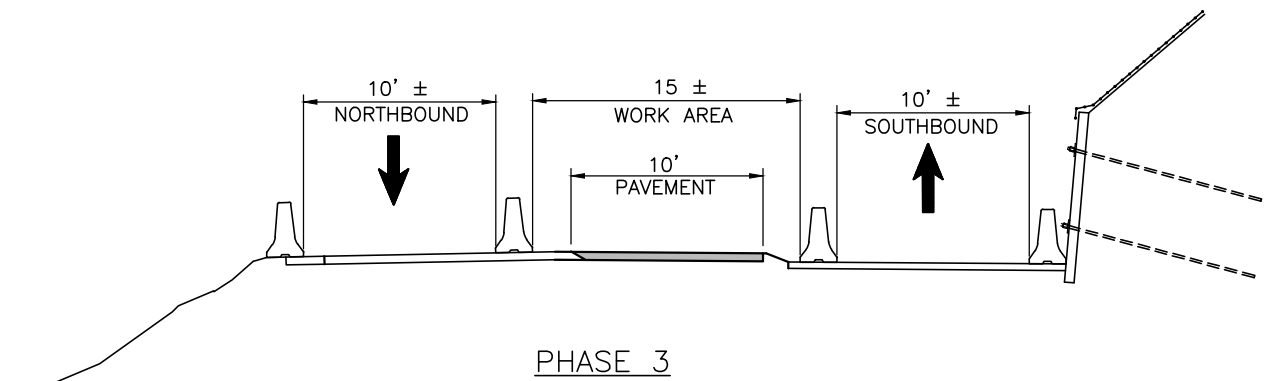
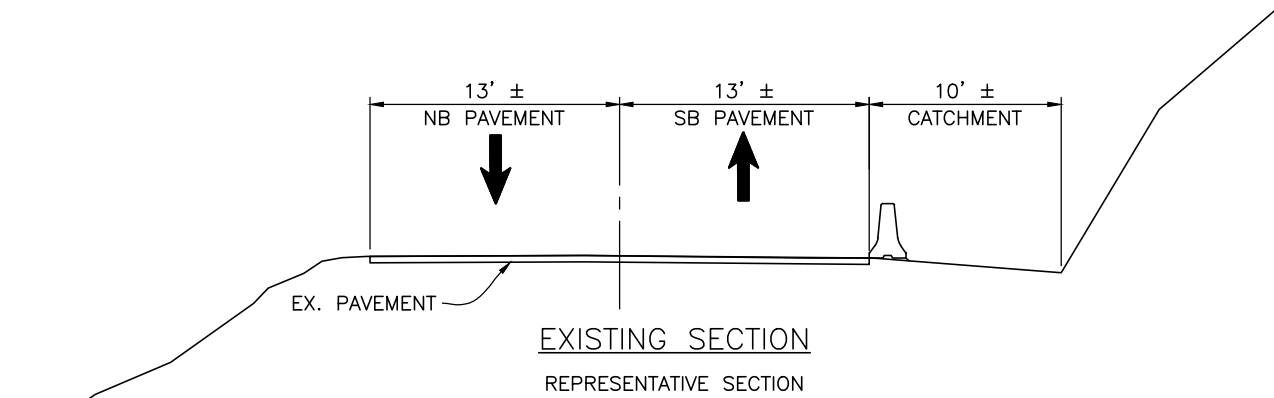
NOTES:

- Unit prices used in developing this EOPC were based on cost estimate data from recent CDOT Cost Data Book(s) compiled by the CDOT Engineering and Market Analysis Unit and SGM's database of similar projects.
- Unit prices and total costs are based on Present Value dollars. Adjustments should be made for years beyond the present year if actual construction occurs in a future year.
- This EOPC was prepared on the basis of SGM's experience and qualifications and represents SGM's judgment as a professional generally familiar with the industry. However, since SGM has no control over the cost of labor, materials, equipment, or services furnished by others, over contractor's methods of determining prices, or over competitive bidding or market conditions, SGM cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from SGM's EOPC.

ENGINEER'S OPINION OF PROBABLE COST - UNIT PRICE ANALYSIS

CATEGORY	ITEM NO.	CDOT REF. NO.	CONTRACT ITEM	UNIT	QUANTITY	ENGINEER'S ESTIMATE		UNIT PRICES FROM REFERENCE PROJECTS										UNIT PRICES FROM CDOT COST DATA									
						UNIT COST	EXTENDED COST	REF. 1	REF. 2	REF. 3	REF. 4	REF. 5	REF. 6	REF. 7	REF. 8	REF. 9	REF. 10	2017	2016	2015	2014	2013	2012	2011	2010		
REM	1	201-00000	CLEARING AND GRUBBING	L S	1	\$ 34,000.00	\$ 34,000.00	\$ 10,000.00	\$ 17,250.00			\$ 90,000.00		\$ 10,900.00	\$ 15,498.00		\$ 45,483.08		\$ 27,648.36	\$ 68,785.16	\$ 48,641.20	\$ -	\$ 23,052.61	\$ 34,561.34	\$ 29,425.73	\$ 22,895.99	
REM	2	202-00008	TREE TRIMMING	HOURL	40	\$ 200.00	\$ 8,000.00												\$ 310.00	\$ 301.30	\$ 430.00	\$ -	\$ 163.50	\$ 149.50	\$ 141.62	\$ 88.69	
REM	3	202-00010	REMOVAL OF TREE	EACH	25	\$ 500.00	\$ 12,500.00	\$ 1,210.00	\$ 266.00	\$ 368.69				\$ 310.00	\$ 783.00				\$ 362.12	\$ 359.85	\$ 366.20	\$ -	\$ 270.73	\$ 354.89	\$ 185.09	\$ 200.00	
REM	4	202-00019	REMOVAL OF INLET	EACH	5	\$ 750.00	\$ 3,750.00		\$ 642.50	\$ 757.58				\$ 900.00	\$ 1,188.00				\$ 746.22	\$ 1,020.87	\$ 918.20	\$ -	\$ 678.21	\$ 567.00	\$ 415.61	\$ 500.06	
REM	5	202-00031	REMOVAL OF FIRE HYDRANT	EACH	4	\$ 4,000.00	\$ 16,000.00												\$ 4,200.00	\$ 2,064.60	\$ 1,144.00	\$ -	\$ 697.84	\$ 1,664.36	\$ 500.00	\$ 633.63	
UTIL	6	202-00035	REMOVAL OF PIPE	LF	359	\$ 25.00	\$ 8,975.00						\$ 10.75	\$ 57.56				\$ 36.73	\$ 18.88	\$ 23.27	\$ 27.28	\$ 28.50	\$ -	\$ 16.55	\$ 17.16	\$ 16.83	\$ 15.27
REM	7	202-00155	REMOVAL OF WALL	LF	209	\$ 50.00	\$ 10,450.00		\$ 24.00					\$ 54.07					\$ 22.77	\$ 31.64	\$ 54.34	\$ -	\$ 52.00	\$ 14.50	\$ 47.72	\$ 17.52	
REM	8	202-00200	REMOVAL OF SIDEWALK	SY	1120	\$ 20.00	\$ 22,400.00		\$ 15.13	\$ 9.09				\$ 17.12					\$ 19.71	\$ 13.18	\$ 13.54	\$ -	\$ 8.74	\$ 13.29	\$ 8.37	\$ 7.18	
REM	9	202-00202	REMOVAL OF GUTTER	LF	224	\$ 15.00	\$ 3,360.00							\$ 19.70					\$ 12.85	\$ 13.46	\$ 12.40	\$ -	\$ 8.84	\$ 5.03	\$ 3.33	\$ 11.02	
REM	10	202-00203	REMOVAL OF CURB AND GUTTER	LF	1923	\$ 15.00	\$ 28,845.00	\$ 12.60	\$ 7.63	\$ 3.03			\$ 47.00	\$ 8.37					\$ 7.80	\$ 6.80	\$ 7.33	\$ -	\$ 4.89	\$ 4.69	\$ 3.54	\$ 3.90	
REM	11	202-00210	REMOVAL OF CONCRETE PAVEMENT	SY	1067	\$ 25.00	\$ 26,675.00	\$ 24.75						\$ 15.12					\$ 26.13	\$ 10.77	\$ 13.21	\$ -	\$ 5.55	\$ 4.94	\$ 5.96	\$ 9.20	
REM	12	202-00220	REMOVAL OF ASPHALT MAT	SY	23661	\$ 10.00	\$ 236,610.00	\$ 7.60	\$ 11.00	\$ 6.06	\$ 18.00		\$ 18.50	\$ 11.23		\$ 7.25	\$ 3.91		\$ 6.88	\$ 5.11	\$ 7.55	\$ -	\$ 3.12	\$ 3.79	\$ 3.64	\$ 3.34	
REM	13	202-00495	REMOVAL OF PORTIONS OF PRESENT STRUCTURE	L S	1	\$ 10,000.00	\$ 10,000.00												\$ 15,542.00	\$ 50,885.64	\$ 157,954.25	\$ -	\$ 9,091.94	\$ 18,136.90	\$ 17,665.00	\$ 22,801.21	
REM	14	202-00810	REMOVAL OF GROUND SIGN	EACH	17	\$ 150.00	\$ 2,550.00	\$ 130.00	\$ 116.50	\$ 255.10	\$ 105.39			\$ 48.60			\$ 86.11		\$ 95.85	\$ 84.45	\$ 84	\$ -	\$ 61.76	\$ 45.60	\$ 102.24	\$ 77.36	
REM	15	202-00889	REMOVAL OF DETECTABLE WARNING	EACH	2	\$ 500.00	\$ 1,000.00												\$ 637.50	N/A	N/A	\$ -	N/A	N/A	N/A	N/A	
REM	16	202-01000	REMOVAL OF FENCE	LF	786	\$ 3.00	\$ 2,358.00	\$ -		\$ 6.80			\$ 2.85	\$ 8.80			\$ 2.36	\$ 0.61	\$ 1.09	\$ 1.60	\$ 1.53	\$ -	\$ 1.09	\$ 0.58	\$ 0.74	\$ 0.46	
REM	17	202-01130	REMOVAL OF GUARDRAIL TYPE 3	LF	755	\$ 5.00	\$ 3,775.00			\$ 5.33	\$ 4.92			\$ 3.13			\$ 4.92	\$ 2.41	\$ 4.11	\$ 3.77	\$ 3.33	\$ -	\$ 2.33	\$ 2.30	\$ 2.39	\$ 1.96	
REM	18	202-01140	REMOVAL OF GUARDRAIL TYPE 4	LF	1274	\$ 15.00	\$ 19,110.00				\$ 17.17			\$ 31.95					\$ 24.09	\$ 12.41	\$ 8.63	\$ -	\$ 16.77	\$ 8.68	\$ 10.23	\$ 10.01	
REM	19	202-05026	SAWING ASPHALT MATERIAL (6 INCH)	LF	160	\$ 5.00	\$ 800.00				\$ 2.56		\$ 5.50						\$ 1.46	\$ 3.52	\$ 2.62	\$ -	\$ 3.51	\$ 2.06	\$ 2.48	\$ 1.92	
EW	20	203-00010	UNCLASSIFIED EXCAVATION (COMPLETE IN PLACE)	CY	11168	\$ 30.00	\$ 335,039.40	\$ 31.35		\$ 21.21	\$ 54.87		\$ 28.60	\$ 29.80					\$ 37.13	\$ 10.12	\$ 16.72	\$ -	\$ 9.45	\$ 8.37	\$ 6.38	\$ 9.31	
EW	21	203-00100	MUCK EXCAVATION	CY	100	\$ 50.00	\$ 5,000.00	\$ 36.00		\$ 36.36	\$ 44.03			\$ 46.33			\$ 20.01		\$ 39.74	\$ 21.46	\$ 19.82	\$ -	\$ 15.45	\$ 11.26	\$ 13.22	\$ 12.56	
UTIL	22	203-01597	POTHOLING	HOURL	60	\$ 225.00	\$ 13,500.00	\$ 211.00	\$ 197.50	\$ 237.37	\$ 230.77		\$ 176.63	\$ 239.76			\$ 251.81	\$ 229.71	\$ 216.37	\$ 233.60	\$ 217.36	\$ -	\$ 208.31	\$ 145.15	\$ 177.98	\$ 157.89	
ROCK	23	203-02300	ROCK SCALER	HOURL	40	\$ 200.00	\$ 8,000.00								\$ 119.13			\$ 190.05	\$ 274.94	\$ 112.94	\$ -	\$ 110.00	\$ 76.58	\$ 98.09	\$ 81.98		
WALL	24	206-00000	STRUCTURE EXCAVATION	CY	1746	\$ 30.00	\$ 52,380.00		\$ 22.75	\$ 30.30	\$ 27.48		\$ 34.00	\$ 41.77		\$ 20.28	\$ 9.08	\$ 24.80	\$ 17.72	\$ 31.55	\$ -	\$ 9.87	\$ 13.32	\$ 7.36	\$ 7.79		
WALL	25	206-00100	STRUCTURE BACKFILL (CLASS 1)	CY	727	\$ 50.00	\$ 36,357.14			\$ 42.42	\$ 64.58		\$ 57.26	\$ 65.14		\$ 43.75	\$ 23.61	\$ 52.68	\$ 35.76	\$ 46.20	\$ -	\$ 20.51	\$ 28.37	\$ 13.94	\$ 16.68		
WALL	26	206-00200	STRUCTURE BACKFILL (CLASS 2)	CY	40	\$ 45.00	\$ 1,812.86		\$ 39.00	\$ 21.21	\$ 28.11		\$ 170.00	\$ 35.68		\$ 50.67	\$ 12.00	\$ 33.48	\$ 35.61	\$ 31.54	\$ -	\$ 17.84	\$ 19.85	\$ 10.60	\$ 16.57		
WALL	27	206-00520	FILTER MATERIAL (CLASS B)	CY	214	\$ 90.00	\$ 19,285.71											\$ 89.38	\$ 85.86	\$ 126.97	\$ -	N/A	\$ 47.13	\$ 35.98	\$ 36.58		
EC	28	207-00205	TOPSOIL	CY	1680	\$ 25.00	\$ 42,000.00	\$ 27.00	\$ 8.75			\$ 52.58	\$ 49.50	\$ 80.46			\$ 13.63		\$ 17.96	\$ 12.17	\$ 11.48	\$ -	\$ 8.34	\$ 10.69	\$ 7.55	\$ 11.95	
EC	29	207-00210	STOCKPILE TOPSOIL	CY	1680	\$ 10.00	\$ 16,800.00		\$ 9.43							\$ 8.24		\$ 8.36	\$ 9.20	\$ 14.63	\$ -	\$ 9.00	\$ 6.81	\$ 5.04	\$ 2.29		
EC	30	208-00002	EROSION LOG TYPE 1 (12 INCH)	LF	16400	\$ 5.00	\$ 82,000.00		\$ 4.25	\$ 4.25	\$ 3.67	\$ 10.17		\$ 3.76	\$ 13.00	\$ 3.46	\$ 3.58	\$ 5.00	\$ 4.89	\$ 4.27	\$ -	\$ 3.84	\$ 4.09	\$ 3.53	\$ 3.68		
EC	31	208-00020	SILT FENCE	LF	0	\$ 5.00	\$ -									\$ 1.16		\$ 1.92	\$ 1.51	\$ 2.42	\$ -	\$ 1.73	\$ 1.28	\$ 1.15	\$ 1.12		
EC	32	208-00035	AGGREGATE BAG	LF	0	\$ 10.00	\$ -			\$ 3.39	\$ 7.53	\$ 13.00		\$ 3.24				\$ 9.63	\$ 7.83	\$ 6.92	\$ -	\$ 7.82	N/A	N/A	N/A		
EC	33	208-00045	CONCRETE WASHOUT STRUCTURE	EACH	2	\$ 2,500.00	\$ 5,000.00	\$ 1,160.00	\$ 1,650.00	\$ 2,083.26	\$ 1,492.66	\$ 2,123.33	\$ 650.00	\$ 10,265.64		\$ 1,143.07	\$ 832.02	\$ 2,656.73	\$ 1,247.60	\$ 1,553.04	\$ -	\$ 781.96	\$ 761.80	\$ 781.81	\$ 605.82		
EC	34	208-00051	STORM DRAIN INLET PROTECTION (TYPE I)	LF	12	\$ 20.00	\$ 240.00		\$ 18.50	\$ 3.39				\$ 4.32				\$ 13.76	\$ 8.48	\$ 7.38	\$ -	\$ 5.05	\$ 8.01	\$ 4.40	\$ 6.46		
EC	35	208-00070	VEHICLE TRACKING PAD	EACH	2	\$ 2,000.00	\$ 4,000.00	\$ 1,650.00	\$ 2,000.00	\$ 1,338.38	\$ 2,709.57		\$ 1,063.80			\$ 1,798.72	\$ 1,816.73	\$ 3,310.73	\$ 2,008.38	\$ 2,079.67	\$ -	\$ 1,603.90	\$ 1,446.63	\$ 1,162.61	\$ 1,209.39		
EC	36	208-00207	EROSION CONTROL MANAGEMENT	DAY	215	\$ 200.00	\$ 43,000.00											\$ 199.41	\$ 302.65	N/A	\$ -	N/A	N/A	N/A	N/A		
REM	37	210-00010	RESET MAILBOX STRUCTURE	EACH	5	\$ 200.00	\$ 1,000.00			\$ 408.16						\$ 233.95		\$ 3,627.16	\$ 183.75	\$ 237.49	\$ -	\$ 207.93	\$ 303.98	\$ 218.00	\$ 107.62		
REM	38	210-00050	RESET FIRE HYDRANT	EACH	1	\$ 6,000.00	\$ 6,000.00							\$ 9,666.00				N/A	\$ 5,939.04	\$ 6,971.60	\$ -	\$ 3,319.83	\$ 6,000.00	N/A	\$ 3,377.60		
REM	39	210-00810	RESET GROUND SIGN	EACH	5	\$ 300.00	\$ 1,500.00	\$ 350.00	\$ 519.50	\$ 382.65	\$ 391.46		\$ 270.00						\$ 229.71	\$ 267.73	\$ 260.45	\$ -	\$ 277.97	\$ 274.61	\$ 221.27	\$ 189.40	
REM	40	210-00825	RESET FLASHING BEACON	EACH	1	\$ 500.00	\$ 500.00			\$ 1,957.28								\$ 776.18	\$ 1,957.14	\$ 2,225.00	\$ -	\$ 1,562.88	\$ 1,741.76	\$ 1,160.00	\$ 100.00		
REM	41	210-04010	ADJUST MANHOLE	EACH	9	\$ 1,000.00	\$ 9,000.00	\$ 885.00	\$ 1,757.50				\$ 600.00	\$ 612.36				\$ 859.55	\$ 594.38	\$ 795.07	\$ -	\$ 497.45	\$ 467.20	\$ 549.28	\$ 419.43		
REM	42	210-04020	MODIFY INLET	EACH	2	\$ 750.00	\$ 1,500.00			\$ 631.32				\$ 1,420.20				\$ 3,279.72	\$ 2,746.07	\$ 1,770.20	\$ -	\$ 1,963.63	\$ 1,909.14	\$ 1,729.98	\$ 1,570.19		
REM	43	210-04050	ADJUST VALVE BOX	EACH	6	\$ 500.00	\$ 3,000.00	\$ 362.00					\$ 232.00	\$ 378.00				\$ 552.58	\$ 281.13	\$ 410.55	\$ -	\$ 342.32	\$ 273.90	\$ 147.84	\$ 177.13		
EC	44	212-00006	SEEDING (NATIVE)	ACRE	1	\$ 1,000.00	\$ 750.00	\$ 7,620.00	\$ 1,932.50	\$ 462.36	\$ 997.57	\$ 5,572.00	\$ 4,052.86	\$ 1,036.80		\$ 692.50	\$ 458.30	\$ 999.04	\$ 771.76	\$ 729.73	\$ -	\$ 639.29	\$ 552.93	\$ 619.00	\$ 454.07		
EC	45	213-00004	MULCHING (WEED FREE STRAW)	ACRE	1	\$ 1,000.00	\$ 750.00		\$ 1,875.00									\$ 593.71	\$ 785.12	\$ 508.66	\$ -	\$ 483.85	\$ 620.				

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MIDLAND AVE. CROSS SECTION
 OPTION 3B: TWO-WAY TRAFFIC DURING CONSTRUCTION
 (EXTRA PAVEMENT WIDTH)
 SCALE: 1" = 10'

Computer File Information	
Print Date:	4/12/18
Last Modification Date:	1/18/2018
Drawing File Name:	ConstructionPhasing-Options
Autocad Ver.	2018
Scale:	As Shown
Units:	English
SGM Project No.:	2017-211.001
Quality Control:	RLM

Sheet Revisions				
Rev.	Date	Comments	Init.	
1				



As Constructed	
No Revisions:	-
Revised:	-
Void:	-

South Midland Ave. Improvements Construction Phasing Typical Sections (2)			
Engineer:	MDF	Structure	--
Drawn By:	AMC	Numbers	--
Sheet Subset:	Const. Phasing	Subset Sheets:	2 of 2

Project No./Code	
No.:	---
Code:	--
Sheet Number:	37

ENGINEER'S OPINION OF PROBABLE COST (EOPC)



PROJECT: South Midland Avenue - Option 3B- 43' total width; 27' pavement, 10' catchment width
SGM NO.: 2017-211.001
DATE: 4/18/2018
EOPC LEVEL: Post - 30% Design
PREPARED BY: Ron Nies
REVIEWED BY:

ROADWAY CONSTRUCTION ITEMS	ESTIMATED COST	% OF (a)
Removals and Resets	\$ 464,500	7.0%
Earthwork (Excavation, Embankment)	\$ 340,000	5.2%
Erosion Control	\$ 194,500	3.0%
Surfacing (Base Course, Pavement, C & G, Sidewalk)	\$ 2,446,500	37.1%
Roadway (Guardrail, Fence)	\$ 141,000	2.1%
Drainage (Pipes, Inlets, Manholes)	\$ 692,500	10.5%
Retaining Walls (Block Wall, Railing, Soil Nail Wall)	\$ 1,360,000	20.6%
Rockfall Mitigation (Mesh above Walls)	\$ 370,500	5.6%
Traffic Control during Construction	\$ 528,500	8.0%
Signing and Striping	\$ 53,000	0.8%
Force Accounts (Incentives, MCRs)	\$ -	0.0%
SUBTOTAL OF CONSTRUCTION ITEMS:	\$ 6,591,000 (a)	

OTHER PROJECT COSTS	ESTIMATED COST	% OF (a)
Contingency (Final Design Items, Phased Const.)	\$ 988,500	15.0%
Mobilization	\$ 395,500	6.0%
Lighting	\$ 99,500	1.5%
Utilities (Electrical)	\$ 70,500	1.1%
Landscaping	\$ -	0.0%
Construction Surveying	\$ 66,000	1.0%
Construction Management (Inspection & Testing)	\$ 329,500	5.0%
SUBTOTAL OF OTHER PROJECT COSTS:	\$ 1,949,500 (b)	

ENGINEER'S OPINION OF TOTAL PROJECT COSTS (a) + (b):	\$8,540,500
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NOTES:

- Unit prices used in developing this EOPC were based on cost estimate data from recent CDOT Cost Data Book(s) compiled by the CDOT Engineering and Market Analysis Unit and SGM's database of similar projects.
- Unit prices and total costs are based on Present Value dollars. Adjustments should be made for years beyond the present year if actual construction occurs in a future year.
- This EOPC was prepared on the basis of SGM's experience and qualifications and represents SGM's judgment as a professional generally familiar with the industry. However, since SGM has no control over the cost of labor, materials, equipment, or services furnished by others, over contractor's methods of determining prices, or over competitive bidding or market conditions, SGM cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from SGM's EOPC.

ENGINEER'S OPINION OF PROBABLE COST - UNIT PRICE ANALYSIS

CATEGORY	ITEM NO.	CDOT REF. NO.	CONTRACT ITEM	UNIT	QUANTITY	ENGINEER'S ESTIMATE		UNIT PRICES FROM REFERENCE PROJECTS										UNIT PRICES FROM CDOT COST DATA								
						UNIT COST	EXTENDED COST	REF. 1	REF. 2	REF. 3	REF. 4	REF. 5	REF. 6	REF. 7	REF. 8	REF. 9	REF. 10	2017	2016	2015	2014	2013	2012	2011	2010	
REM	1	201-00000	CLEARING AND GRUBBING	L S	1	\$ 34,000.00	\$ 34,000.00	\$ 10,000.00	\$ 17,250.00			\$ 90,000.00		\$ 10,900.00	\$ 15,498.00		\$ 45,483.08		\$ 27,648.36	\$ 68,785.16	\$ 48,641.20	\$ -	\$ 23,052.61	\$ 34,561.34	\$ 29,425.73	\$ 22,895.99
REM	2	202-00008	TREE TRIMMING	HOURL	40	\$ 200.00	\$ 8,000.00											\$ 310.00	\$ 301.30	\$ 430.00	\$ -	\$ 163.50	\$ 149.50	\$ 141.62	\$ 88.69	
REM	3	202-00010	REMOVAL OF TREE	EACH	25	\$ 500.00	\$ 12,500.00	\$ 1,210.00	\$ 266.00	\$ 368.69				\$ 310.00	\$ 783.00			\$ 362.12	\$ 359.85	\$ 366.20	\$ -	\$ 270.73	\$ 354.89	\$ 185.09	\$ 200.00	
REM	4	202-00019	REMOVAL OF INLET	EACH	5	\$ 750.00	\$ 3,750.00		\$ 642.50	\$ 757.58				\$ 900.00	\$ 1,188.00			\$ 746.22	\$ 1,020.87	\$ 918.20	\$ -	\$ 678.21	\$ 567.00	\$ 415.61	\$ 500.06	
REM	5	202-00031	REMOVAL OF FIRE HYDRANT	EACH	4	\$ 4,000.00	\$ 16,000.00											\$ 4,200.00	\$ 2,064.60	\$ 1,144.00	\$ -	\$ 697.84	\$ 1,664.36	\$ 500.00	\$ 633.63	
UTIL	6	202-00035	REMOVAL OF PIPE	LF	359	\$ 25.00	\$ 8,975.00						\$ 10.75	\$ 57.56			\$ 36.73	\$ 18.88	\$ 23.27	\$ 27.28	\$ 28.50	\$ -	\$ 16.55	\$ 17.16	\$ 16.83	\$ 15.27
REM	7	202-00155	REMOVAL OF WALL	LF	209	\$ 50.00	\$ 10,450.00		\$ 24.00					\$ 54.07				\$ 22.77	\$ 31.64	\$ 54.34	\$ -	\$ 52.00	\$ 14.50	\$ 47.72	\$ 17.52	
REM	8	202-00200	REMOVAL OF SIDEWALK	SY	1120	\$ 20.00	\$ 22,400.00		\$ 15.13	\$ 9.09				\$ 17.12				\$ 19.71	\$ 13.18	\$ 13.54	\$ -	\$ 8.74	\$ 13.29	\$ 8.37	\$ 7.18	
REM	9	202-00202	REMOVAL OF GUTTER	LF	224	\$ 15.00	\$ 3,360.00							\$ 19.70				\$ 12.85	\$ 13.46	\$ 12.40	\$ -	\$ 8.84	\$ 5.03	\$ 3.33	\$ 11.02	
REM	10	202-00203	REMOVAL OF CURB AND GUTTER	LF	1923	\$ 15.00	\$ 28,845.00	\$ 12.60	\$ 7.63	\$ 3.03			\$ 47.00	\$ 8.37				\$ 7.80	\$ 6.80	\$ 7.33	\$ -	\$ 4.89	\$ 4.69	\$ 3.54	\$ 3.90	
REM	11	202-00210	REMOVAL OF CONCRETE PAVEMENT	SY	1067	\$ 25.00	\$ 26,675.00	\$ 24.75						\$ 15.12				\$ 26.13	\$ 10.77	\$ 13.21	\$ -	\$ 5.55	\$ 4.94	\$ 5.96	\$ 9.20	
REM	12	202-00220	REMOVAL OF ASPHALT MAT	SY	23661	\$ 10.00	\$ 236,610.00	\$ 7.60	\$ 11.00	\$ 6.06	\$ 18.00		\$ 18.50	\$ 11.23		\$ 7.25	\$ 3.91	\$ 6.88	\$ 5.11	\$ 7.55	\$ -	\$ 3.12	\$ 3.79	\$ 3.64	\$ 3.34	
REM	13	202-00495	REMOVAL OF PORTIONS OF PRESENT STRUCTURE	L S	1	\$ 10,000.00	\$ 10,000.00											\$ 15,542.00	\$ 50,885.64	\$ 157,954.25	\$ -	\$ 9,091.94	\$ 18,136.90	\$ 17,665.00	\$ 22,801.21	
REM	14	202-00810	REMOVAL OF GROUND SIGN	EACH	17	\$ 150.00	\$ 2,550.00	\$ 130.00	\$ 116.50	\$ 255.10	\$ 105.39			\$ 48.60			\$ 86.11	\$ 95.85	\$ 84.45	\$ 84	\$ -	\$ 61.76	\$ 45.60	\$ 102.24	\$ 77.36	
REM	15	202-00889	REMOVAL OF DETECTABLE WARNING	EACH	2	\$ 500.00	\$ 1,000.00											\$ 637.50	N/A	N/A	\$ -	N/A	N/A	N/A	N/A	
REM	16	202-01000	REMOVAL OF FENCE	LF	786	\$ 3.00	\$ 2,358.00	\$ -		\$ 6.80			\$ 2.85	\$ 8.80		\$ 2.36	\$ 0.61	\$ 1.09	\$ 1.60	\$ 1.53	\$ -	\$ 1.09	\$ 0.58	\$ 0.74	\$ 0.46	
REM	17	202-01130	REMOVAL OF GUARDRAIL TYPE 3	LF	755	\$ 5.00	\$ 3,775.00			\$ 5.33	\$ 4.92			\$ 3.13		\$ 4.92	\$ 2.41	\$ 4.11	\$ 3.77	\$ 3.33	\$ -	\$ 2.33	\$ 2.30	\$ 2.39	\$ 1.96	
REM	18	202-01140	REMOVAL OF GUARDRAIL TYPE 4	LF	1274	\$ 15.00	\$ 19,110.00				\$ 17.17			\$ 31.95				\$ 24.09	\$ 12.41	\$ 8.63	\$ -	\$ 16.77	\$ 8.68	\$ 10.23	\$ 10.01	
REM	19	202-05026	SAWING ASPHALT MATERIAL (6 INCH)	LF	160	\$ 5.00	\$ 800.00				\$ 2.56		\$ 5.50					\$ 1.46	\$ 3.52	\$ 2.62	\$ -	\$ 3.51	\$ 2.06	\$ 2.48	\$ 1.92	
EW	20	203-00010	UNCLASSIFIED EXCAVATION (COMPLETE IN PLACE)	CY	11168	\$ 30.00	\$ 335,039.40	\$ 31.35		\$ 21.21	\$ 54.87		\$ 28.60	\$ 29.80				\$ 37.13	\$ 10.12	\$ 16.72	\$ -	\$ 9.45	\$ 8.37	\$ 6.38	\$ 9.31	
EW	21	203-00100	MUCK EXCAVATION	CY	100	\$ 50.00	\$ 5,000.00	\$ 36.00		\$ 36.36	\$ 44.03			\$ 46.33			\$ 20.01	\$ 39.74	\$ 21.46	\$ 19.82	\$ -	\$ 15.45	\$ 11.26	\$ 13.22	\$ 12.56	
UTIL	22	203-01597	POTHOLING	HOURL	60	\$ 225.00	\$ 13,500.00	\$ 211.00	\$ 197.50	\$ 237.37	\$ 230.77		\$ 176.63	\$ 239.76		\$ 251.81	\$ 229.71	\$ 216.37	\$ 233.60	\$ 217.36	\$ -	\$ 208.31	\$ 145.15	\$ 177.98	\$ 157.89	
ROCK	23	203-02300	ROCK SCALER	HOURL	40	\$ 200.00	\$ 8,000.00								\$ 119.13		\$ 190.05	\$ 274.94	\$ 112.94	\$ -	\$ 110.00	\$ 76.58	\$ 98.09	\$ 81.98		
WALL	24	206-00000	STRUCTURE EXCAVATION	CY	1746	\$ 30.00	\$ 52,380.00		\$ 22.75	\$ 30.30	\$ 27.48		\$ 34.00	\$ 41.77		\$ 20.28	\$ 9.08	\$ 24.80	\$ 17.72	\$ 31.55	\$ -	\$ 9.87	\$ 13.32	\$ 7.36	\$ 7.79	
WALL	25	206-00100	STRUCTURE BACKFILL (CLASS 1)	CY	727	\$ 50.00	\$ 36,357.14			\$ 42.42	\$ 64.58		\$ 57.26	\$ 65.14		\$ 43.75	\$ 23.61	\$ 52.68	\$ 35.76	\$ 46.20	\$ -	\$ 20.51	\$ 28.37	\$ 13.94	\$ 16.68	
WALL	26	206-00200	STRUCTURE BACKFILL (CLASS 2)	CY	40	\$ 45.00	\$ 1,812.86		\$ 39.00	\$ 21.21	\$ 28.11		\$ 170.00	\$ 35.68		\$ 50.67	\$ 12.00	\$ 33.48	\$ 35.61	\$ 31.54	\$ -	\$ 17.84	\$ 19.85	\$ 10.60	\$ 16.57	
WALL	27	206-00520	FILTER MATERIAL (CLASS B)	CY	214	\$ 90.00	\$ 19,285.71											\$ 89.38	\$ 85.86	\$ 126.97	\$ -	N/A	\$ 47.13	\$ 35.98	\$ 36.58	
EC	28	207-00205	TOPSOIL	CY	1680	\$ 25.00	\$ 42,000.00	\$ 27.00	\$ 8.75			\$ 52.58	\$ 49.50	\$ 80.46		\$ 13.63		\$ 17.96	\$ 12.17	\$ 11.48	\$ -	\$ 8.34	\$ 10.69	\$ 7.55	\$ 11.95	
EC	29	207-00210	STOCKPILE TOPSOIL	CY	1680	\$ 10.00	\$ 16,800.00		\$ 9.43						\$ 8.24		\$ 8.36	\$ 9.20	\$ 14.63	\$ -	\$ 9.00	\$ 6.81	\$ 5.04	\$ 2.29		
EC	30	208-00002	EROSION LOG TYPE 1 (12 INCH)	LF	16400	\$ 5.00	\$ 82,000.00		\$ 4.25	\$ 4.25	\$ 3.67	\$ 10.17		\$ 3.76	\$ 13.00	\$ 3.46	\$ 3.58	\$ 5.00	\$ 4.89	\$ 4.27	\$ -	\$ 3.84	\$ 4.09	\$ 3.53	\$ 3.68	
EC	31	208-00020	SILT FENCE	LF	0	\$ 5.00	\$ -								\$ 1.16		\$ 1.92	\$ 1.51	\$ 2.42	\$ -	\$ 1.73	\$ 1.28	\$ 1.15	\$ 1.12		
EC	32	208-00035	AGGREGATE BAG	LF	0	\$ 10.00	\$ -			\$ 3.39	\$ 7.53	\$ 13.00		\$ 3.24			\$ 9.63	\$ 7.83	\$ 6.92	\$ -	\$ 7.82	N/A	N/A	N/A		
EC	33	208-00045	CONCRETE WASHOUT STRUCTURE	EACH	2	\$ 2,500.00	\$ 5,000.00	\$ 1,160.00	\$ 1,650.00	\$ 2,083.26	\$ 1,492.66	\$ 2,123.33	\$ 650.00	\$ 10,265.64		\$ 1,143.07	\$ 832.02	\$ 2,656.73	\$ 1,247.60	\$ 1,553.04	\$ -	\$ 781.96	\$ 761.80	\$ 781.81	\$ 605.82	
EC	34	208-00051	STORM DRAIN INLET PROTECTION (TYPE I)	LF	12	\$ 20.00	\$ 240.00		\$ 18.50	\$ 3.39				\$ 4.32			\$ 13.76	\$ 8.48	\$ 7.38	\$ -	\$ 5.05	\$ 8.01	\$ 4.40	\$ 6.46		
EC	35	208-00070	VEHICLE TRACKING PAD	EACH	2	\$ 2,000.00	\$ 4,000.00	\$ 1,650.00	\$ 2,000.00	\$ 1,338.38	\$ 2,709.57		\$ 1,063.80		\$ 1,798.72	\$ 1,816.73	\$ 3,310.73	\$ 2,008.38	\$ 2,079.67	\$ -	\$ 1,603.90	\$ 1,446.63	\$ 1,162.61	\$ 1,209.39		
EC	36	208-00207	EROSION CONTROL MANAGEMENT	DAY	215	\$ 200.00	\$ 43,000.00										\$ 199.41	\$ 302.65	N/A	\$ -	N/A	N/A	N/A	N/A		
REM	37	210-00010	RESET MAILBOX STRUCTURE	EACH	5	\$ 200.00	\$ 1,000.00			\$ 408.16					\$ 233.95		\$ 3,627.16	\$ 183.75	\$ 237.49	\$ -	\$ 207.93	\$ 303.98	\$ 218.00	\$ 107.62		
REM	38	210-00050	RESET FIRE HYDRANT	EACH	1	\$ 6,000.00	\$ 6,000.00						\$ 9,666.00				N/A	\$ 5,939.04	\$ 6,971.60	\$ -	\$ 3,319.83	\$ 6,000.00	N/A	\$ 3,377.60		
REM	39	210-00810	RESET GROUND SIGN	EACH	5	\$ 300.00	\$ 1,500.00	\$ 350.00	\$ 519.50	\$ 382.65	\$ 391.46		\$ 270.00				\$ 229.71	\$ 267.73	\$ 260.45	\$ -	\$ 277.97	\$ 274.61	\$ 221.27	\$ 189.40		
REM	40	210-00825	RESET FLASHING BEACON	EACH	1	\$ 500.00	\$ 500.00			\$ 1,957.28							\$ 776.18	\$ 1,957.14	\$ 2,225.00	\$ -	\$ 1,562.88	\$ 1,741.76	\$ 1,160.00	\$ 100.00		
REM	41	210-04010	ADJUST MANHOLE	EACH	9	\$ 1,000.00	\$ 9,000.00	\$ 885.00	\$ 1,757.50				\$ 600.00	\$ 612.36			\$ 859.55	\$ 594.38	\$ 795.07	\$ -	\$ 497.45	\$ 467.20	\$ 549.28	\$ 419.43		
REM	42	210-04020	MODIFY INLET	EACH	2	\$ 750.00	\$ 1,500.00			\$ 631.32			\$ 1,420.20				\$ 3,279.72	\$ 2,746.07	\$ 1,770.20	\$ -	\$ 1,963.63	\$ 1,909.14	\$ 1,729.98	\$ 1,570.19		
REM	43	210-04050	ADJUST VALVE BOX	EACH	6	\$ 500.00	\$ 3,000.00	\$ 362.00					\$ 232.00	\$ 378.00			\$ 552.58	\$ 281.13	\$ 410.55	\$ -	\$ 342.32	\$ 273.90	\$ 147.84	\$ 177.13		
EC	44	212-00006	SEEDING (NATIVE)	ACRE	1	\$ 1,000.00	\$ 750.00	\$ 7,620.00	\$ 1,932.50	\$ 462.36	\$ 997.57	\$ 5,572.00	\$ 4,052.86	\$ 1,036.80		\$ 692.50	\$ 458.30	\$ 999.04	\$ 771.76	\$ 729.73	\$ -	\$ 639.29	\$ 552.93	\$ 619.00	\$ 454.07	
EC	45	213-00004	MULCHING (WEED FREE STRAW)	ACRE	1	\$ 1,000.00	\$ 750.00		\$ 1,875.00								\$ 593.71	\$ 785.12	\$ 508.66	\$ -	\$ 483.85	\$ 620.00	\$ 893.54	\$ 573.21		
EC	46	213-00061	MULCH TACKIFIER	LB	0	\$ 5.00	\$ -		\$ 5.63	\$ 2.63		\$ 13.50		\$ 2.70		\$ 1.97	\$									

ENGINEER'S OPINION OF PROBABLE COST - UNIT PRICE ANALYSIS

CATEGORY	ITEM NO.	CDOT REF. NO.	CONTRACT ITEM	UNIT	QUANTITY	ENGINEER'S ESTIMATE	
						UNIT COST	EXTENDED COST
RDWY	86	606-10200	BRIDGE RAIL (SPECIAL)	LF	20	\$ 150.00	\$ 3,000.00
RDWY	87	607-11455	FENCE WOOD	LF	250	\$ 50.00	\$ 12,500.00
RDWY	88	607-53160	FENCE CHAIN LINK (60 INCH)	LF	220	\$ 25.00	\$ 5,500.00
ROCK	89	607-55040	MESH ANCHOR	EACH	338	\$ 400.00	\$ 135,080.00
ROCK	90	607-55050	MESH ANCHOR (SPECIAL)	EACH	157	\$ 950.00	\$ 149,435.00
ROCK	91	607-55103	CABLE NET (SPECIAL)	SF	12958	\$ 6.00	\$ 77,748.00
RDWY	92	607-60110	10 FOOT GATE	EACH	1	\$ 1,000.00	\$ 1,000.00
SURF	93	608-00000	CONCRETE SIDEWALK	SY	2917	\$ 60.00	\$ 175,020.00
SURF	94	608-00005	CONCRETE SIDEWALK (SPECIAL)	SY	0	\$ 80.00	\$ -
SURF	95	608-00010	CONCRETE CURB RAMP	SY	300	\$ 150.00	\$ 45,000.00
SURF	96	608-00015	DETECTABLE WARNINGS	SF	320	\$ 60.00	\$ 19,200.00
SURF	97	609-20010	CURB TYPE 2 (SECTION B)	LF	229	\$ 40.00	\$ 9,160.00
SURF	98	609-20011	CURB TYPE 2 (SECTION M)	LF	295	\$ 40.00	\$ 11,800.00
SURF	99	609-21020	CURB AND GUTTER TYPE 2 (SECTION II-B)	LF	10039	\$ 35.00	\$ 351,365.00
SURF	100	609-21021	CURB AND GUTTER TYPE 2 (SECTION II-M)	LF	259	\$ 40.00	\$ 10,360.00
SURF	101	609-24004	GUTTER TYPE 2 (4 FOOT)	LF	359	\$ 50.00	\$ 17,950.00
SURF	102	610-00020	MEDIAN COVER MATERIAL (PATTERNED CONCRETE)	SF	5710	\$ 10.00	\$ 57,100.00
RDWY	103	612-00001	DELINEATOR (TYPE I)	EACH	0	\$ 30.00	\$ -
RDWY	104	612-00002	DELINEATOR (TYPE II)	EACH	0	\$ 30.00	\$ -
RDWY	105	612-00003	DELINEATOR (TYPE III)	EACH	0	\$ 30.00	\$ -
UTIL	106	613-01202	2 INCH ELECTRICAL CONDUIT (PLASTIC) (INSTALL ONLY)	LF	3436	\$ 2.50	\$ 8,590.00
UTIL	107	613-01302	3 INCH ELECTRICAL CONDUIT (PLASTIC) (INSTALL ONLY)	LF	1279	\$ 2.50	\$ 3,197.50
UTIL	108	613-01602	6 INCH ELECTRICAL CONDUIT (PLASTIC)(INSTALL ONLY)	LF	1853	\$ 2.50	\$ 4,632.50
UTIL	109	613-07023	PULL BOX (24"X36"X24")	EACH	1	\$ 1,500.00	\$ 1,500.00
UTIL	110	613-08000	VAULT (INSTALL ONLY)	EACH	4	\$ 5,000.00	\$ 20,000.00
LIGHT	111	613-01202	2 INCH ELECTRICAL CONDUIT (PLASTIC) (INSTALL ONLY)	LF	3835	\$ 2.50	\$ 9,587.50
LIGHT	112	613-30300	LIGHT STANDARD ALUMINUM (30 FOOT)	EACH	20	\$ 3,000.00	\$ 60,000.00
LIGHT	113	613-40010	LIGHT STANDARD FOUNDATION	EACH	20	\$ 1,500.00	\$ 30,000.00
SS	114	614-00011	SIGN PANEL (CLASS I)	SF	0	\$ 30.00	\$ -
SS	115	614-00200	STEEL SIGN POST (U-2)	LF	0	\$ 15.00	\$ -
SS	116	614-01503	STEEL SIGN SUPPORT (2-INCH ROUND)(POST AND SOCKET)	EACH	0	\$ 200.00	\$ -
RDWY	117	618-06034	PRESTRESSED CONCRETE SLAB (DEPTH 6" THROUGH 13")	SF	60	\$ 150.00	\$ 9,000.00
UTIL	118	619-78048	6 INCH FIRE HYDRANT	EACH	2	\$ 5,000.00	\$ 10,000.00
MISC	119	625-00000	CONSTRUCTION SURVEYING	L S	1	\$ -	\$ -
MOB	120	626-00000	MOBILIZATION	L S	1	\$ -	\$ -
SS	121	627-00008	MODIFIED EPOXY PAVEMENT MARKING	GAL	63	\$ 150.00	\$ 9,450.00
SS	122	627-30305	PREFORMED PLASTIC PAVEMENT MARKING (60 MIL) (WORD- SYMBOL)	SF	562	\$ 20.00	\$ 11,240.00
SS	123	627-30310	PREFORMED PLASTIC PAVEMENT MARKING (60 MIL) (XWALK-STOP LINE)	SF	1626	\$ 20.00	\$ 32,514.00
TC	124	630-00000	FLAGGING	HOUR	5160	\$ 30.00	\$ 154,800.00
TC	125	630-00007	TRAFFIC CONTROL INSPECTION	DAY	86	\$ 400.00	\$ 34,400.00
TC	126	630-00012	TRAFFIC CONTROL MANAGEMENT	DAY	215	\$ 950.00	\$ 204,250.00
TC	127	630-80341	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE A)	EACH	0	\$ 50.00	\$ -
TC	128	630-80355	PORTABLE MESSAGE SIGN PANEL	EACH	2	\$ 5,000.00	\$ 10,000.00
TC	129	630-80370	CONCRETE BARRIER (TEMPORARY)	LF	5000	\$ 25.00	\$ 125,000.00
TC	130	630-80380	TRAFFIC CONE	EACH	0	\$ 10.00	\$ -
TC	131	630-80384	TUBULAR MARKER	EACH	0	\$ 40.00	\$ -
WALL	132	641-10000	SHOTCRETE	SY	2076	\$ 200.00	\$ 415,200.00
						TOTAL COST	\$ 6,761,250.74

UNIT PRICES FROM REFERENCE PROJECTS										UNIT PRICES FROM CDOT COST DATA							
REF. 1	REF. 2	REF. 3	REF. 4	REF. 5	REF. 6	REF. 7	REF. 8	REF. 9	REF. 10	2017	2016	2015	2014	2013	2012	2011	2010
									N/A	\$ 104.16	\$ 49.00	N/A	\$ -	N/A	N/A	N/A	\$ 37.00
									N/A	\$ 32.00	\$ 50.90	\$ 17.25	\$ -	N/A	\$ 5.00	N/A	N/A
									N/A	N/A	\$ 75.00	N/A	\$ -	N/A	N/A	\$ 40.82	N/A
							\$ 374.00		N/A	N/A	N/A	\$ 498.69	\$ -	N/A	\$ 243.17	\$ 593.42	\$ 217.03
							\$ 920.40		N/A	\$ 1,827.00	\$ 1,606.00	\$ 1,065.00	\$ -	\$ 620.00	\$ 517.76	N/A	\$ 773.92
							\$ 4.95		N/A	N/A	N/A	N/A	\$ -	\$ 3.97	\$ 3.66	N/A	\$ 5.95
									N/A	N/A	N/A	\$ 511.33	\$ -	\$ 1,562.50	N/A	N/A	N/A
\$ 60.00	\$ 56.10				\$ 65.78	\$ 57.63			N/A	\$ 49.83	\$ 54.86	\$ 33.98	\$ -	\$ 35.47	\$ 36.34	\$ 21.58	\$ 29.02
\$ 153.00		\$ 53.65				\$ 60.61			N/A	N/A	\$ 52.44	\$ 60.11	\$ -	\$ 44.35	\$ 92.68	N/A	\$ 45.00
\$ 95.25		\$ 147.97			\$ 124.25	\$ 244.84			N/A	\$ 186.00	\$ 140.87	\$ 139.04	\$ -	\$ 108.45	\$ 90.99	\$ 92.04	\$ 79.60
\$ 57.10	\$ 63.00	\$ 65.51			\$ 76.74	\$ 62.75			N/A	\$ 114.80	\$ 57.77	\$ 74.82	\$ -	\$ 45.34	\$ 51.67	\$ 36.03	\$ 44.81
		\$ 18.64				\$ 34.62			N/A	\$ 36.93	\$ 28.47	\$ 26.82	\$ -	\$ 20.36	\$ 25.81	\$ 25.78	\$ 17.19
									N/A	N/A	\$ 40.00	\$ 23.50	\$ -	N/A	\$ 29.05	N/A	N/A
	\$ 40.00	\$ 23.72				\$ 38.85			N/A	\$ 33.50	\$ 25.00	\$ 22.08	\$ -	\$ 16.69	\$ 16.05	\$ 13.18	\$ 13.21
						\$ 38.88			N/A	\$ 37.88	\$ 25.95	\$ 18.30	\$ -	\$ 19.40	\$ 18.84	\$ 16.40	\$ 10.44
\$ 45.75						\$ 43.36			N/A	\$ 48.27	\$ 47.06	\$ 43.30	\$ -	\$ 23.45	\$ 31.23	\$ 22.39	\$ 21.23
\$ 7.50						\$ 13.20			N/A	\$ 8.58	\$ 9.01	\$ 10.11	\$ -	\$ 6.57	\$ 6.26	\$ 5.65	\$ 4.10
		\$ 25.51	\$ 26.10			\$ 70.20		\$ 24.93	N/A	\$ 28.23	\$ 24.44	\$ 24.39	\$ -	\$ 21.22	\$ 18.56	\$ 21.18	\$ 15.87
		\$ 30.61				\$ 70.20			N/A	\$ 26.28	\$ 28.08	\$ 28.96	\$ -	\$ 22.74	\$ 21.78	\$ 21.05	\$ 17.92
		\$ 30.61	\$ 26.10			\$ 70.20		\$ 25.92	N/A	\$ 35.36	\$ 33.17	\$ 30.40	\$ -	\$ 22.53	\$ 22.78	\$ 26.85	\$ 18.96
	\$ 13.00								N/A	N/A	\$ 19.75	N/A	\$ -	N/A	\$ 16.51	N/A	N/A
									N/A	N/A	\$ 61.00	N/A	\$ -	N/A	N/A	N/A	N/A
		\$ 11.18							N/A	N/A	\$ 17.00	\$ 11.96	\$ -	N/A	\$ 20.00	N/A	N/A
	\$ 1,725.00					\$ 990.08			N/A	\$ 1,383.87	\$ 1,511.99	\$ 2,187.89	\$ -	\$ 1,167.24	\$ 1,004.48	\$ 913.60	\$ 782.53
			\$ 3,556.63			\$ 6,893.78			N/A	\$ 5,325.00	N/A	\$ 5,040.87	\$ -	N/A	N/A	N/A	N/A
	\$ 13.00								N/A	N/A	\$ 19.75	N/A	\$ -	N/A	\$ 16.51	N/A	N/A
	\$ 2,599.00	\$ 1,249.90				\$ 1,175.11			N/A	\$ 1,365.96	\$ 1,544.98	\$ 1,331.06	\$ -	\$ 1,496.12	\$ 1,014.94	\$ 922.41	\$ 851.96
\$ 26.00	\$ 29.50	\$ 21.43	\$ 20.58			\$ 28.08			\$ 17.46	\$ 20.89	\$ 21.28	\$ 20.82	\$ -	\$ 16.58	\$ 17.03	\$ 19.37	\$ 15.12
						\$ 124.20			N/A	\$ 17.84	\$ 13.00	\$ 11.13	\$ -	N/A	\$ 16.81	\$ 10.05	\$ 4.03
									N/A	\$ 150.63	\$ 214.15	\$ 177.64	\$ -	\$ 128.59	\$ 180.10	\$ 118.01	\$ 97.20
									N/A	N/A	N/A	N/A	\$ -	N/A	N/A	\$ 26.27	\$ 58.00
									N/A	\$ 4,376.00	\$ 5,987.60	\$ 4,422.00	\$ -	\$ 4,657.24	\$ 4,667.89	\$ 5,848.02	\$ 11,799.25
\$ 49,500.00	\$ 36,600.00	\$ 208,569.10	\$ 82,979.16			\$ 326,953.94		\$ 24,135.69	\$ 42,496.92	\$ 84,611.86	\$ 67,628.43	\$ 43,692.59	\$ -	\$ 32,852.17	\$ 28,504.30	\$ 29,330.49	\$ 24,724.61
\$ 332,625.00	\$ 660,000.00		\$ 621,623.00	\$ 558,796.67	\$ 74,616.38	\$ 136,862.12	\$ 171,438.00	\$ 432,739.74	\$ 400,952.87	\$ 208,441.22	\$ 295,558.34	\$ 240,603.45	\$ -	\$ 259,614.48	\$ 165,941.59	\$ 211,129.05	\$ 173,737.79
									N/A	\$ 61.31	\$ 75.78	\$ 60.23	\$ -	N/A	N/A	N/A	N/A
									N/A	N/A	N/A	\$ 20.00	\$ -	N/A	N/A	N/A	N/A
						\$ 17.28			N/A	\$ 14.00	N/A	\$ 17.28	\$ -	N/A	N/A	N/A	N/A
\$ 38	\$ 33	\$ 28	\$ 28	\$ 31		\$ 28	\$ 25	\$ 15	\$ 26	\$ 26.33	\$ 26	\$ 25	\$ -	\$ 22	\$ 21	\$ 21	\$ 21
\$ 415.00	\$ 310.00	\$ 348.72	\$ 612.30	\$ 231.00		\$ 194.40	\$ 107.29	\$ 425.45	\$ 194.09	\$ 201.09	\$ 180.51	\$ 184.65	\$ -	\$ 157.34	\$ 140.54	\$ 73.90	\$ 121.53
\$ 1,025.00	\$ 977.50	\$ 1,004.06	\$ 823.10			\$ 1,188.00	\$ 736.75	\$ 584.29	\$ 410.42	\$ 818.50	\$ 893.21	\$ 760.60	\$ -	\$ 600.50	\$ 557.82	\$ 440.60	\$ 455.69
\$ 53.45	\$ 30.00	\$ 61.54	\$ 20.58	\$ 23.42		\$ 54.00	\$ 45.96	\$ 23.57	\$ 38.69	\$ 49.57	\$ 54.04	\$ 44.88	\$ -	\$ 37.10	\$ 33.94	\$ 45.87	\$ 33.84
	\$ 2,375.00	\$ 5,128.21				\$ 1,080.00		\$ 1,628.07	\$ 3,231.50	\$ 5,275.97	\$ 5,262.32	\$ 5,009.06	\$ -	\$ 4,409.25	\$ 3,970.18	\$ 4,490.96	\$ 4,047.31
\$ 50.00	\$ 37.13	\$ 11.49	\$ 34.84	\$ 70.33		\$ 65.25		\$ 33.14	\$ 25.68	\$ 43.94	\$ 24.80	\$ 34.57	\$ -	\$ 30.91	\$ 24.91	\$ 24.88	\$ 21.18
\$ 11.00	\$ 6.00	\$ 15.38	\$ 5.27	\$ 1.58		\$ 5.40	\$ 3.45	\$ 2.22	\$ 1.21	\$ 7.13	\$ 8.44	\$ 8.92	\$ -	\$ 6.46	\$ 5.88	\$ 6.46	\$ 5.70
	\$ 43.50																