HDR

Tampa, Florida

Technical Memorandum

TO: TED LINCKS
FROM: HDR ENGINEERING, INC.
DATE: December 28,1992
SUBJECT: S.R. 39 WIDENING, STRUCTURES
STATE PROJECT NUMBERS 14110-1503 & 10200-1508
W.P.I. NUMBERS 7115925 & 7113335
FAP NUMBER F-321-1(4)

A. Description of Existing Structures

Along the S.R. 39 corridor between I-4 in Hillsborough County and U.S. 301 in Pasco County there are four (4) structures on record with the Florida Department of Transportation having a bridge number. From south to north these four structures are:

Bridge Number 100036:

This bridge, crossing Blackwater Creek, is located in Section No. 10200 of S.R. 39 at Mile Post 8.573 in Hillsborough County. The 162-foot long structure has six spans of approximately 27 feet. The bridge was constructed in 1915 and had two arches spanning 53.5 feet. In 1941 the bridge was rehabilitated using only the existing substructure, resulting in the current six span structure. The bridge was designed for an H-15 vehicle as specified in the State Road Department Design Specifications of 1937.

The substructure consists of solid wall-type concrete piers on a spread footing. The superstructure includes 21-inch Wide Flange (59 pound) steel girders spaced at 5.5 feet with a seven inch reinforced concrete deck.

The most recent inspection report is dated August 21, 1990. The overall ratings are:

Substructure Overall Rating	-	7
Superstructure Overall Rating	-	7
Deck Overall Rating	-	7
Approach Roadway Overall Rating	-	7
Channel Overall Rating	-	7

A structural rating of 7 in the inspection report is described to be:

"GOOD CONDITION - Some minor problems. Minor maintenance may be needed."

Functionally, the structure is obsolete because of its narrow width of 24 feet between curbs. In addition, the traffic railing does not meet the current standards.

Bridge Number 100037:

This structure is just north of bridge number 100036, crossing part of the floodplain of the Blackwater Creek in Hillsborough County. The culvert is located in Section 10200 at Mile Post 8.729 of S.R. 39. The total length of the structure is 45 feet and consists of three 15-foot arches. Its purpose is to handle any overflow from Blackwater Creek and normally the structure is dry. The culvert was constructed in 1914 as a three arch structure.

The Last inspection report is dated August 16, 1990. In this report the culvert received the following overall ratings:

Culvert Overall Rating	-	7
Approach Roadway Overall Rating	-	8
Channel Overall Rating	-	8

A structural rating of 8 in the inspection report is described to be:

"VERY GOOD CONDITION - No problems noted."

Functionally the structure is obsolete because of its narrow width of 24 feet between curbs. In addition, the traffic railing does not meet the current standards.

Bridge Number 100038:

This is a three bay culvert across the Heron Branch in Section 10200 at Mile Post 10.000 of S.R. 39 in Hillsborough County. This culvert was constructed in 1941 and has been rehabilitated by the Florida Department of Transportation in 1988. The rehabilitation work consisted of lengthening the structure to meet recent standards that require the head walls to be 30 feet from the outside lane edge in a 55-MPH zone. Current standards (January, 1992) require a 36-foot clear zone.

The last inspection report is dated August 24, 1987. In this report the culvert gets the following overall ratings:

Culvert Overall Rating	-	8
Approach Roadway Overall Rating	-	8
Channel Overall Rating	-	7

Bridge Number 140007:

This is a bridge across the Hillsborough River in Pasco County. The structure was constructed in 1947 and is located in Section 14110 at Mile Post 1.585 of S.R. 39. The structure has 21 spans of 15 feet resulting in an overall structure length of 315.5 feet. The substructure consists of pile bents. Each pile bent has five timber piles, spaced at six feet, topped by a 1.83-foot square cap. The superstructure is a 13-inch deep flat slab structure. The bridge was designed for an H-20 vehicle as specified in the 1944 edition of the AASHTO Standard Specifications for Highway Bridges.

The most resent inspection report is dated September 11, 1991. The overall ratings are:

Substructure Overall Rating	-	7
Superstructure Overall Rating	-	7
Deck Overall Rating	-	7
Approach Roadway Overall Rating	-	8
Channel Overall Rating	-	8

Some of the timber piles are starting to show signs of rot but are in surprisingly good shape after 40 years of service.

Functionally, the structure is obsolete because of its narrow width of 26 feet between curbs. The traffic railing does not meet current standards.

B. Structure Alternatives.

There are two major alternatives that can be considered for the structures that are part of this project. These options are:

1. Widening the existing structures.

2. Replace the existing structures with new ones.

1. Bridge Widening:

All structures are getting rather old as mentioned in the "Description of Existing Structures":

- most parts of the bridge over the Blackwater Creek are 51 years old with some of the substructure being 77 years old;

- the culvert over the Blackwater Creek Overflow is 77 years old; and

- the bridge over the Hillsborough River was constructed in 1947 making it 45 years old.

All structures received a good rating in the latest Bridge Inspection Report. Their age, however, and structural items such as timber piles, do not justify a bridge widening. These bridges will require major repairs in the near future. In a project such as this one, where lanes need to be added to improve the level of service, a widening of the existing structure, with a live expectancy of about 10 to 15 years, should not be considered.

2. Bridge Replacement:

A variety of structure types can be considered as bridge replacements. A phased construction scheme would be possible for all of these structures making the maintenance of traffic during construction relatively easy. During the first construction phase, traffic can continue using the existing structure while the new bridge is being constructed next to the existing bridge. During the second phase, traffic will be on the new structure while the old bridge is being demolished or widened and a new structure is constructed in its place.

Substructure Alternatives:

a. Piles that are integrally connected with the superstructure (usually a flat slab). This solution is not very popular with the construction industry. The support system for the form work of the flat slab is rather complicated and is easier to accomplish when a pile cap is used.

b. Pile bents. In the past these have proven to be a very economical solution for low level water crossings. It is expected that an 18-inch or 20-inch prestressed concrete pile will be used for this project. It is not expected that 24-inch piles will be needed unless corrosive environment is found.

c. Pier type substructures are only economical for high level structures and can be omitted from further consideration. This is also true for a wall-type substructure on a spread footing as was used for the existing Blackwater Creek Bridge. These structures are very expensive to construct since the site at each pier needs to be drained temporarily in order to construct the foundation.

Based on the above discussion it is recommended that only a pile bent substructure be considered. Piles to be used are 18-inch or 20-inch reinforced concrete piles, unless the corrosiveness of the environment would make the use of 24-inch piles mandatory.

Superstructure Alternatives:

a. Flat Slab Structure. This could be a very good solution in areas where clearance plays a major role and short spans are not objectionable. For the Hillsborough River Bridge the clearance will not be a problem and the deeper precast concrete options will definitely be more economical. For Blackwater Creek, clearance may be an issue and at this location a flat slab may be an option worth considering.

b. Precast Prestressed Girders. For this project Types II, III and IV could be considered, depending on the length of the bridge, the required clearances, the cost of the substructure, etc. For the Hillsborough River, for instance, it is possible that the type IV alternate may be the most economical solution, whereas Type II girders could be the best solution for the Blackwater Creek structure.

c. Precast Concrete Slab Option. Approximately four years ago this alternate was approved again for use on projects in the State of Florida. The required transverse post-tensioning and the fact that no voids are allowed in the section, however, make this a rather expensive solution. It is recommended that this alternate not be given further consideration.

d. Steel Girder Alternate. In the past, this option has proven to be a less economical solution than the precast concrete girder options for this type of structure (relatively short spans). The State of Florida has a policy prohibiting the use of steel structures where the vertical clearance over water is less than 24 feet. Based on this policy and on the historical cost record, it was decided not to consider this alternate further.

The above alternates will now be addressed in more detail for the individual sites.

Bridges over Blackwater Creek and Relief Channel.

It is proposed to replace these two structures by one set of twin bridges. These replacement structures will have to provide the same or larger water opening as the two existing structures combined.

The overall length of the current Blackwater Creek bridge is approximately 162 feet and the structure over the relief channel has an overall length of 45 feet. The new structures need to have an overall length of at least 207 feet in order to provide an equal water opening. The proposed overall length of the new structure will be 210 feet.

With this overall length the following span arrangements can be considered:

A: Five interior spans of 32.0 feet and end spans of 25.0 feet
B: Four interior spans of 37.5 feet and end spans of 30.0 feet
C: Three interior spans of 46.0 feet and end spans of 36.0 feet
D: Five spans of 42.0 feet
E: Four spans of 52.5 feet
F: Three spans of 70.0 feet
G: Two spans of 105.0 feet

The span layouts "A" through "C" are for a continuous flat slab superstructure on a pile bent substructure. For span layouts "D" and "E" Type II prestressed girders are used, whereas Type III prestressed girders are used for span layout "F". Both alternates utilize a pile bent substructure. The last span layout "G" is possible with a Type IV prestressed girder.

The costs of the various options are shown in tables I-A through I-G of the Appendix A summary of the cost of the seven alternates is listed below:

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Flat Slab (L=32.0 Ft.)	$931,113	$51.86	130%	5
B	Flat Slab (L=37.5 Ft.)	$960,684	$53.51	134%	6
C	Flat Slab (L=42.0 Ft.)	$1,124,913	$62.65	157%	7
D	Type II Beams (L=42.0 Ft.)	$742,282	$41.34	104%	2
E	Type II Beams (L=52.5 Ft.)	$716,033	$39.88	100%	1
F	Type III Beams (L=60.0 Ft.)	$780,181	$43.45	109%	3
G	Type IV Beams (L=105 Ft.)	$894.042	$49.79	125%	4

Alternates "D" and "E" are clearly more economical than the other options. Choosing between these two options could be left until the structures are actually designed. We would like to recommend, however, that option "E" be considered for design.

Records indicate that most of the initial maintenance on structures is done on the pilings in the form of pile jackets. For a relatively small expense (approximately $50,000) one pile bent could be eliminated by choosing alternate "F" instead of "E" or "D". This would reduce the number of piles with future maintenance risks.

The bridge/culvert over the Relief Channel of the Blackwater Creek has a unique rustic facia finish and is of some historic value. Possible ways to preserving the facia are:

1. Preserve all of existing structure.

   This solution would require the new roadways to be located on either side of the old structure. This creates an open space between the roadways and could serve as a pic-nic area, with the old bridge serving as a "monument" in this roadside park.

2. Widen the existing structure to one side only.

   On the side where the roadway would be widened, the facia would be removed and not be restored. This probably would be the most feasible solution to preserve some of the features of the old structure. The inspection report appears to indicate that the culvert structure itself is still in good shape and continued use appears to be feasible.

3. Widening the structure to one or both sides, preserving the facia completely.

   This would require the careful separation of the facia from the existing structure. This could possibly be accomplished by cutting the culvert and its foundation somewhere behind the facia wall. Moving the facia wall without damaging it will be the problem that needs to be resolved. The wall is approximately 70 feet long and, once disconnected from the main culvert structure, will weigh in the order of 85 tons. One could imagine a steel frame that is attached to the wall to keep all parts rigidly in place and some strategically place lifting points. The wall could then be lifted and placed in its new position. If the new structure would be another culvert the old facia could be made a part of this structure. If a bridge would replace the existing culvert, the facia could still be placed on its own foundation and in the end make it all look like a culvert where in reality it is "covering up" a bridge that, most likely, will have only one span.

   If lifting of the wall would prove to be a bit too much for a standard crane, one could consider sliding or rolling the wall assembly to its new location. This would require a few sliding/roller beams, maybe one at each arch spring point. Suggested rollers are the so called "Hillman" rollers. Greased timber might give a good sliding solution.

Bridges over Upland Areas.

For some of the upland areas it may be necessary to provide structures to allow wildlife to pass underneath S.R. 39. Criteria set forth by Hillsborough County indicate that structures with an overall length of approximately 180 feet will be required. The exact locations of these crossings will be identified during the design phase through coordination with the Florida Game and Freshwater Fish Commission and Hillsborough County Environmental Land Acquisition and Protection Program. The structural options will be very similar to the ones that were discussed for the Blackwater Creek crossing: a flat slab bridge and Type II, III, and IV precast concrete girder alternates.

With the 180-foot overall length the following span arrangements can be considered:

A: Four interior spans of 32.0 feet and end spans of 26.0 feet
B: Three interior spans of 39.0 feet and end spans of 31.5 feet
C: Two interior spans of 50.0 feet and end spans of 40.0 feet
D: Four spans of 45.0 feet
E: Three spans of 60.0 feet
F: Two spans of 90.0 feet

The span layouts "A" through "C" are for a continuous flat slab superstructure. For span layouts "D", "E" , and "F" prestressed girders Type II, III, and IV respectively are used. All alternates utilize a pile bent substructure.

The costs of the various options are shown in tables II-A through II-F (see Appendix). A summary of the cost for the six alternates is listed below:

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Flat Slab (L=32.0 Ft.)	$824,666	$53.58	126%	4
B	Flat Slab (L=39.0 Ft.)	$896,331	$58.24	137%	5
C	Flat Slab (L=50.0 Ft.)	$1,021,172	$66.35	157%	6
D	Type II Beams (L=45.0 Ft.)	$652,068	$42.37	100%	1
E	Type III Beams (L=60.0 Ft.)	$679,067	$44.12	104%	2
F	Type IV Beams (L=90.0 Ft.)	$716,926	$46.58	110%	3

Alternates "D" and "E" are clearly more economical than the other options. Even option "F" could be considered, because of the smaller number of substructure components required, having benefits for future maintenance. Choosing between these three options could be left until the structures are actually designed. We would like to recommend, however, that option "E" be considered for design.

Bridge over Big Ditch.

Currently S.R. 39 crosses Big Ditch on a culvert. The possible replacement structure could be as long as 520 feet. This maximum length is derived from the Hillsborough County guidelines for the provision of wildlife corridors at wetland crossings. The 520-foot dimension will be used to make a comparative study of the alternate structures. The options for Big Ditch are very similar to the ones that were discussed for the Blackwater Creek crossing: a flat slab structure and Type II, III, and IV precast concrete girder alternates.

With the 520-foot overall length the following span arrangements can be considered:

A: Sixteen spans of 32.5 feet
B: Thirteen spans of 40.0 feet
C: Ten spans of 52.0 feet
D: Ten spans of 52.0 feet
E: Eight spans of 65.0 feet
F: Six spans of 86.67 feet

The span layouts "A" through "C" are for a continuous flat slab superstructure. For span layouts "D", "E" , and "F" prestressed girders Type II, III, and IV respectively are used. All alternates utilize a pile bent substructure.

The costs of the various options are shown in tables III-A through III-F (see Appendix). A summary of the cost of the six alternates is listed on the following page.

Alternates "D" and "E" are clearly more economical than the other options. Even option "F" should be considered, because of the smaller number of substructure components required, having benefits for future maintenance. Choosing between these three options could be left until the structures are actually designed. We would like to recommend, however, that option "E" be considered for design.

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Flat Slab (L=32.5 Ft.)	$1,954,234	$43.95	134%	4
B	Flat Slab (L=40.0 Ft.)	$2,121,809	$47.72	145%	5
C	Flat Slab (L=52.0 Ft.)	$2,482,923	$55.85	170%	6
D	Type II Beams (L=52.0 Ft.)	$1,458,875	$32.81	100%	1
E	Type III Beams (L=65.0 Ft.)	$1,516,186	$34.10	104%	2
F	Type IV Beams (L=86.7 Ft.)	$1,655,301	$37.23	113%	3

Bridge over the Hillsborough River.

The overall length of the current structure is 315.5 feet. Replacing this bridge with twin structures of about the same overall length, would result in an overall length for the new bridges of 320 feet.

The flat slab option was not economical for the shorter Blackwater Creek structures and is therefore not considered for the Hillsborough River crossing.

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Type II Beams (L=40.0 Ft.)	$1,422,497	$51.99	104%	3
B	Type II Beams (L=45.7 Ft.)	$1,386,917	$50.69	101%	2
C	Type II Beams (L=53.3 Ft.)	$1,370,495	$50.09	100%	1
D	Type III Beams (L=64.0 Ft.)	$1,426,132	$52.12	104%	4
E	Type III Beams (L=80.0 Ft.)	$1,513,749	$55.33	110%	5
F	Type IV Beams (L=80.0 Ft.)	$1,518,306	$55.49	111%	6
G	Type IV Beams (L=106.7 Ft.)	$1,640,146	$59.95	120%	7

There is a spread of approximately 10% in the cost of the first six options. The option with Type IV girders and the long span turns out to be quite a bit more expensive and should be excluded from further consideration. The other six options, however, should all be studied in the design phase.

For these bridges it should also be emphasized that a slightly more expensive structure with longer spans should be selected over a less expensive structure with short spans. In this case the choice could fall on option "D" with the Type III girders and 64-foot spans. Having three or two less bents than options "B" and "C" respectively is worth the extra cost in order to reduce future maintenance problems.

b. For the 320-long bridge a considerable area of floodplain needs to be filled with embankment, which brings us to this and the next two options. To reduce the area affected by new embankment, a longer bridge for the southbound structure, spanning the floodplain between the 25-year storm elevations, could be considered. This would substantially reduce the length of the new embankment and only the existing embankment needs to be widened to accommodate the wider northbound roadway. The length of the southbound structure would be in the range of 2240 feet, while the overall length of the northbound structure remains at 320 feet and thus the effective hydraulic bridge opening does not change. The spans for each structure should be the same in order for the pile bents to line up.

The cost of the various options has been shown in tables V-A through V-G of the Appendix. Included in the cost for the various alternates of the Hillsborough River crossing is the cost for excavation and embankment as shown in table V-H.

A summary of the cost of the seven alternates is listed below:

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Type II Beams (L=40.0 Ft.)	$4,312,390	$39.40	102%	3
B	Type II Beams (L=45.7 Ft.)	$4,217,597	$38.54	100%	1
C	Type II Beams (L=53.3 Ft.)	$4,274,974	$39.06	101%	2
D	Type III Beams (L=64.0 Ft.)	$4,757,281	$43.47	113%	4
E	Type III Beams (L=80.0 Ft.)	$5,377,356	$49.14	127%	6
F	Type IV Beams (L=80.0 Ft.)	$5,325,214	$48.66	126%	5
G	Type IV Beams (L=106.7 Ft.)	$6,331,776	$57.86	150%	7

There is a spread of approximately 13% in the cost of the first four options. The option with the longer Type III and Type IV girders turn out to be quite a bit more expensive. The 80-foot Type IV girder, however, should still be considered, having the longer spans and a lower number of pile bents. The 80-foot Type III and 107-foot Type IV should be dropped from further studies.

c. A third option, requiring approximately the same amount of bridge deck as the previous one, might be more attractive. In this case both structures are made equally long. Making the northbound structure longer and the southbound bridge shorter would result in a larger hydraulic bridge opening (this needs to be studied if this alternate is considered). The area required for new embankment is approximately the same as that required for the previous option and will partly be mitigated by removal of some of the old embankment on the existing alignment.

The cost of the various options are shown in tables VI-A through VI-G of the Appendix. Included in the cost for the various alternates of the Hillsborough River crossing is the cost for excavation and embankment as shown in table V-H. Note that the material from the old embankment is used in the new embankment.

A summary of the cost of the seven alternates is an listed below:

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Type II Beams (L=40.0 Ft.)	$3,904,295	$35.68	107%	4
B	Type II Beams (L=45.7 Ft.)	$3,736,338	$34.14	103%	2
C	Type II Beams (L=53.3 Ft.)	$3,644,988	$33.31	100%	1
D	Type III Beams (L=64.0 Ft.)	$3,898,506	$35.62	107%	3
E	Type III Beams (L=80.0 Ft.)	$4,206,225	$38.43	115%	6
F	Type IV Beams (L=80.0 Ft.)	$4,194,152	$38.32	115%	5
G	Type IV Beams (L=106.7 Ft.)	$4,619,564	$42.21	127%	7

There is a spread of approximately 15% in the cost of the first six alternates. Alternate "E" and "F" with the longer Type III and Type IV girders respectively, are on the high end of this range. The 80-foot Type IV girder should still be a strong contender,however, having the longer spans and a lower number of pile bents. The 107-foot Type IV should be dropped from further studies.

d. The last option would cross all of the floodplain on structure. This would require an overall bridge length of 2244 feet. All of the old embankment would have to be excavated and no new embankment would be required. This, obviously, increases the hydraulic opening considerably and should be studied for down stream impacts.

The cost of the various alternates has been shown in tables VII-A through VII-G of the Appendix. Included in the cost for the various alternates of the Hillsborough River crossing is the cost for excavation of the old embankment as shown in table V-H of the Appendix.

A summary of the cost of the seven alternates is an listed below:

Alt.	Description	Total Cost	Cost per Sq. Ft.	Ratio	Rank
A	Type II Beams (L=40.0 Ft.)	$6,499,793	$33.94	108%	4
B	Type II Beams (L=45.7 Ft.)	$6,199,456	$32.37	103%	2
C	Type II Beams (L=53.3 Ft.)	$6,033,182	$31.50	100%	1
D	Type III Beams (L=64.0 Ft.)	$6,484,580	$33.86	107%	3
E	Type III Beams (L=80.0 Ft.)	$7,012,401	$36.61	116%	6
F	Type IV Beams (L=80.0 Ft.)	$6,983,697	$36.46	116%	5
G	Type IV Beams (L=106.7 Ft.)	$7,798,182	$40.72	129%	7

There is a spread of approximately 16% in the cost of the first six alternates. Alternate "E" and "F" with the longer Type III and Type IV girders respectively, are on the high end of this range. The 80-foot Type IV girder should still be a strong contender,however, having the longer spans and a lower number of pile bents. The 107-foot Type IV should be dropped from further studies.

In order to see what the impact on the cost of the four different options is, the costs for the 80-foot Type IV girder (alternate "F") have been put together in the following table:

Description	Deck Area	Total Cost	Cost per Sq. Foot	Difference	Ratio
NB: 320 Ft. SB: 320 Ft.	27,360 SF	$1,518,306	$55.49	$0	0%
NB: 320 Ft. SB: 2240 Ft.	109,440 SF	$5,325,214	$48.66	$3,806,908	351%
NB: 1280 Ft. SB: 1280 Ft.	109,440 SF	$4,194,152	$38.32	$2,675,846	276%
NB: 2240 Ft. SB: 2240 Ft.	191,520 SF	$6,983,697	$36.46	$5,465,391	460%

Obviously, the option with the short overall bridge length is the most economical solution. If, environmentally, this is not a desirable situation, the next best solution would be the one with two equally long structures. This would require approximately $2.5 million more. The 2240-foot long structure results in the most expensive option and is approximately $5.5 million dollars more than the first option.

APPENDIX

COST

ESTIMATES

29-Dec-92

SUMMARY

S.R. 39 – BRIDGE OVER BLACKWATER CREEK (210 FT)				
I-A	FLAT SLAB (L=32 FEET)	130%	$51.86 /SF	$931,113
I-B	FLAT SLAB (L=37.5 FEET)	134%	$53.51 /SF	$960,684
I-C	FLAT SLAB (L=46 FEET)	157%	$62.65 /SF	$1,124,913
I-D	TYPE II BEAM (L=42 FEET)	104%	$41.34 /SF	$742,282
I-E	TYPE II BEAMS (L=52.5 FEET)	100%	$39.88 /SF	$716,033
I-F	TYPE III BEAMS (L=70 FEET)	109%	$43.45 /SF	$780,181
I-G	TYPE IV BEAM (L=105 FEET)	125%	$49.79 /SF	$894,042

S.R. 39 – BRIDGE OVER UPLAND AREAS (180 FT)				
II-A	FLAT SLAB (L=32 FEET)	126%	$53.58 /SF	$824,666
II-B	FLAT SLAB (L=39 FEET)	137%	$58.24 /SF	$896,331
II-C	FLAT SLAB (L=50 FEET)	157%	$66.35 /SF	$1,021,172
II-D	TYPE II BEAM (L=45 FEET)	100%	$42.37 /SF	$652,068
II-E	TYPE III BEAM (L=60 FEET)	104%	$44.12 /SF	$679,067
II-F	TYPE IV BEAM (L=90 FEET)	110%	$46.58 /SF	$716,926

S.R. 39 – BRIDGE OVER BIG DITCH (520 FT)				
III-A	FLAT SLAB (L=32.5 FEET)	134%	$43.95 /SF	$1,954,234
III-B	FLAT SLAB (L=40 FEET)	145%	$47.72 /SF	$2,121,809
III-C	FLAT SLAB (L=52 FEET)	170%	$55.85 /SF	$2,482,923
III-D	TYPE II BEAM (L=52 FEET)	100%	$32.81 /SF	$1,458,875
III-E	TYPE III BEAM (L=65 FEET)	104%	$34.10 /SF	$1,516,186
III-F	TYPE IV BEAM (L=86.7 FEET)	113%	$37.23 /SF	$1,655,301

S.R. 39 – BRIDGE OVER HILLSBOROUGH RIVER (320 FT)				
IV-A	TYPE II BEAM (L=40 FEET)	104%	$51.99 /SF	$1,422,497
IV-B	TYPE II BEAM (L=45.7 FEET)	101%	$50.69 /SF	$1,386,917
IV-C	TYPE II BEAM (L=53.3 FEET)	100%	$50.09 /SF	$1,370,495
IV-D	TYPE III BEAM (L=64 FEET)	104%	$52.12 /SF	$1,426,132
IV-E	TYPE III BEAM (L=80 FEET)	110%	$55.33 /SF	$1,513,749
IV-F	TYPE IV BEAM (L=80 FEET)	111%	$55.49 /SF	$1,518,306
IV-G	TYPE IV BEAM (L=106.7 FEET)	120%	$59.95 /SF	$1,640,146

S.R. 39 – BRIDGE OVER HILLSBOROUGH RIVER (320-2240)				
V-A	TYPE II BEAM (L=40 FEET)	102%	$39.40 /SF	$4,312,390
V-B	TYPE II BEAM (L=45.7 FEET)	100%	$38.54 /SF	$4,217,597
V-C	TYPE II BEAM (L=53.3 FEET)	101%	$39.06 /SF	$4,274,974
V-D	TYPE III BEAM (L=64 FEET)	113%	$43.47 /SF	$4,757,281
V-E	TYPE III BEAM (L=80 FEET)	127%	$49.14 /SF	$5,377,356
V-F	TYPE IV BEAM (L=80 FEET)	126%	$48.66 /SF	$5,325,214
V-G	TYPE IV BEAM (L=106.7 FEET)	150%	$57.86 /SF	$6,331,776

S.R. 39 – BRIDGE OVER HILLSBOROUGH RIVER (1280 FT)				
VI-A	TYPE II BEAM (L=40 FEET)	107%	$35.68 /SF	$3,904,295
VI-B	TYPE II BEAM (L=45.7 FEET)	103%	$34.14 /SF	$3,736,338
VI-C	TYPE II BEAM (L=53.3 FEET)	100%	$33.31 /SF	$3,644,988
VI-D	TYPE III BEAM (L=64 FEET)	107%	$35.62 /SF	$3,898,506
VI-E	TYPE III BEAM (L=80 FEET)	115%	$38.43 /SF	$4,206,225
VI-F	TYPE IV BEAM (L=80 FEET)	115%	$38.32 /SF	$4,194,152
VI-G	TYPE IV BEAM (L=106.7 FEET)	127%	$42.21 /SF	$4,619,564

S.R. 39 – BRIDGE OVER HILLSBOROUGH RIVER (2240 FT)				
VII-A	TYPE II BEAM (L=40 FEET)	108%	$33.94 /SF	$6,499,793
VII-B	TYPE II BEAM (L=45.7 FEET)	103%	$32.37 /SF	$6,199,456
VII-C	TYPE II BEAM (L=53.3 FEET)	100%	$31.50 /SF	$6,033,182
VII-D	TYPE III BEAM (L=64 FEET)	107%	$33.86 /SF	$6,484,580
VII-E	TYPE III BEAM (L=80 FEET)	116%	$36.61 /SF	$7,012,401
VII-F	TYPE IV BEAM (L=80 FEET)	116%	$36.46 /SF	$6,983,697
VII-G	TYPE IV BEAM (L=106.7 FEET)	129%	$40.72 /SF	$7,798,182

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S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=32 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	5 @ and	2 @
and Span Length(s)	32.0 Feet	25.0 Feet
Superstructure Type	Flat Slab,	18.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	16		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	6240 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	377.8
Depth	27.0 Inches	LL=	275.4
Length	42.8 Feet		
Total Volume	171.0 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	184.4
Depth	0.0 Feet	LL=	124.5
Length	0.0 Feet		
Total Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	5	2
Span Length	32.0 Feet	25.0 Feet
a) Girders		
Girders per Span	0	0
Girder Length	0.0 Feet	0.0 Feet
Total Girder Length	0.0 Feet	
b) Diaphragms		
Width	0.0 Inches	
Depth	0.0 Inches	
Length	0.0 Feet	
Total Volume	0.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	18.0 Inches	
Length	210.0 Feet	
Total Volume	997.5 CYrds	
d) Traffic Barrier		
Total Length	840.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	6240.0 LF x	$40	=	$249,600
Substructure Concrete	171.0 CY x	$425	=	$72,675
Superstructure Concrete	997.5 CY x	$425	=	$423,938
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	840.0 LF x	$40	=	$33,600
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$931,113**
	COST PER SF		=	**$51.86**

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S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=37.5 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	4 @ and	2 @
and Span Length(s)	37.5 Feet	30.0 Feet
Superstructure Type	Flat Slab,	21.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	14		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	495.5
Depth	27.0 Inches	LL=	293.2
Length	42.8 Feet		
Volume	149.6 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	236.7
Depth	0.0 Feet	LL=	133.9
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	4	2
Span Length	37.5 Feet	30.0 Feet
a) Girders		
Girders per Span	0	0
Girder Length	0.0 Feet	0.0 Feet
Total Girder Length	0.0 Feet	
b) Diaphragms		
Width	0.0 Inches	
Depth	0.0 Inches	
Length	0.0 Feet	
Volume	0.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	21.0 Inches	
Length	210.0 Feet	
Volume	1163.8 CYrds	
d) Traffic Barrier		
Total Length	840.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	5440.0 LF x	$40	=	$217,600
Substructure Concrete	149.6 CY x	$425	=	$63,591
Superstructure Concrete	1163.8 CY x	$425	=	$494,594
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	840.0 LF x	$40	=	$33,600
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
		TOTAL COST	=	**$960,684**
		COST PER SF	=	**$53.51**

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S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=46 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	3 @ and	2 @
and Span Length(s)	46.0 Feet	36.0 Feet
Superstructure Type	Flat Slab,	27.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	12		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	7 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	6240 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	745.4
Depth	27.0 Inches	LL=	309.4
Length	42.8 Feet		
Volume	128.3 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	333.1
Depth	0.0 Feet	LL=	143.9
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	3	2
Span Length	46.0 Feet	36.0 Feet
a) Girders		
Girders per Span	0	0
Girder Length	0.0 Feet	0.0 Feet
Total Girder Length	0.0 Feet	
b) Diaphragms		
Width	0.0 Inches	
Depth	0.0 Inches	
Length	0.0 Feet	
Volume	0.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	27.0 Inches	
Length	210.0 Feet	
Volume	1496.3 CYrds	
d) Traffic Barrier		
Total Length	840.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	6240.0 LF x	$40	=	$249,600
Substructure Concrete	128.3 CY x	$425	=	$54,506
Superstructure Concrete	1496.3 CY x	$425	=	$635,906
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	840.0 LF x	$40	=	$33,600
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
		TOTAL COST	=	$1,124,913
		COST PER SF	=	$62.65

S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=42 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	5 @	
and Span Length(s)	42.0 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	12		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	4640 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	357.5
Depth	27.0 Inches	LL=	302.4
Length	42.8 Feet		
Total Volume	128.3 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	235.6
Depth	4.0 Feet	LL=	151.2
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	5		
Span Length	42.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	41.3 Feet		
Total Girder Length	2062.5 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	50.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	210.0 Feet		
Total Volume	443.3 CYrds		
d) Traffic Barrier			
Total Length	840.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	4640.0 LF x	$40	=	$185,600
Substructure Concrete	163.1 CY x	$425	=	$69,303
Superstructure Concrete	493.3 CY x	$425	=	$209,667
Prestressed Girders	2062.5 LF x	$45	=	$92,813
Traffic Railing	840.0 LF x	$40	=	$33,600
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	$742,282
	COST PER SF		=	$41.34

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S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAMS (L=52.5 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	4 @	
and Span Length(s)	52.5 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	10		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	3840 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	451.4
Depth	27.0 Inches	LL=	320.5
Length	42.8 Feet		
Total Volume	106.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	282.6
Depth	4.0 Feet	LL=	160.2
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	4	
Span Length	52.5 Feet	
a) Girders		
Girders per Span	6 @	7.25 Feet
Girder Length	51.8 Feet	
Total Girder Length	2484.0 Feet	
b) Diaphragms (2 @ interior bents)		
Width	9.0 Inches	
Depth	30.0 Inches	
Length	36.3 Feet	
Total Volume	40.3 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	8.0 Inches	
Length	210.0 Feet	
Total Volume	443.3 CYrds	
d) Traffic Barrier		
Total Length	840.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	3840.0 LF x	$40	=	$153,600
Substructure Concrete	141.7 CY x	$425	=	$60,218
Superstructure Concrete	483.6 CY x	$425	=	$205,535
Prestressed Girders	2484.0 LF x	$45	=	$111,780
Traffic Railing	840.0 LF x	$40	=	$33,600
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	$716,033
	COST PER SF		=	$39.88

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S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAMS (L=70 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	3 @	
and Span Length(s)	70.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	8		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	7 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	4000 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	669.2
Depth	27.0 Inches	LL=	337.0
Length	42.8 Feet		
Total Volume	85.5 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	403.3
Depth	5.0 Feet	LL=	168.5
Length	62.8 Feet		
Total Volume	46.5 CYrds		

2.2 Superstructure

Number of Spans	3		
Span Length	70.0 Feet		
a) Girders			
Girders per Span	6 @	7.25 Feet	
Girder Length	69.3 Feet		
Total Girder Length	2493.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.3 Feet		
Total Volume	38.3 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	210.0 Feet		
Total Volume	443.3 CYrds		
d) Traffic Barrier			
Total Length	840.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	4000.0 LF x	$40	=	$160,000
Substructure Concrete	132.0 CY x	$425	=	$56,092
Superstructure Concrete	481.6 CY x	$425	=	$204,679
Prestressed Girders	2493.0 LF x	$70	=	$174,510
Traffic Railing	840.0 LF x	$40	=	$33,600
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$780,181**
	COST PER SF		=	**$43.45**

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S.R. 39 – BRIDGE OVER BLACKWATER CREEK

TABLE I-G
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=105 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	210.0 Feet	
Number of Spans	2 @	
and Span Length(s)	105.0 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	6		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	10 and	6 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	4160 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	1210.1
Depth	27.0 Inches	LL=	354.2
Length	42.8 Feet		
Total Volume	64.1 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	680.1
Depth	5.5 Feet	LL=	177.1
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	2		
Span Length	105.0 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	104.3 Feet		
Total Girder Length	2919.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	30.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	210.0 Feet		
Total Volume	443.3 CYrds		
d) Traffic Barrier			
Total Length	840.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	4160.0 LF	x	$40	=	$166,400
Substructure Concrete	116.9 CY	x	$425	=	$49,676
Superstructure Concrete	473.3 CY	x	$425	=	$201,167
Prestressed Girders	2919.0 LF	x	$100	=	$291,900
Traffic Railing	840.0 LF	x	$40	=	$33,600
Expansion Joints	171.0 LF	x	$300	=	$51,300
Structure Demolition	LS				$100,000
			TOTAL COST	=	**$894,042**
			COST PER SF	=	**$49.79**

S.R. 39 – BRIDGE OVER UPLAND AREAS

TABLE II-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=32 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	180.0 Feet	
Number of Spans	4 @ and	2 @
and Span Length(s)	32.0 Feet	26.0 Feet
Superstructure Type	Flat Slab,	18.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	14		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	377.8
Depth	27.0 Inches	LL=	275.4
Length	42.8 Feet		
Volume	149.6 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	190.1
Depth	0.0 Feet	LL=	126.4
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	4	2
Span Length	32.0 Feet	26.0 Feet
a) Girders		
Girders per Span	0	0
Girder Length	0.0 Feet	0.0 Feet
Total Girder Length	0.0 Feet	
b) Diaphragms		
Width	0.0 Inches	
Depth	0.0 Inches	
Length	0.0 Feet	
Volume	0.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	18.0 Inches	
Length	180.0 Feet	
Volume	855.0 CYrds	
d) Traffic Barrier		
Total Length	720.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	5440.0 LF x	$40	=	$217,600
Substructure Concrete	149.6 CY x	$425	=	$63,591
Superstructure Concrete	855.0 CY x	$425	=	$363,375
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	720.0 LF x	$40	=	$28,800
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$824,666**
	COST PER SF		=	**$53.58**

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S.R. 39 – BRIDGE OVER UPLAND AREAS

TABLE II-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=39 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	180.0 Feet	
Number of Spans	3 @ and	2 @
and Span Length(s)	39.0 Feet	31.5 Feet
Superstructure Type	Flat Slab,	22.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	12		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	534.4
Depth	27.0 Inches	LL=	295.9
Length	42.8 Feet		
Volume	128.3 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	254.8
Depth	0.0 Feet	LL=	137.7
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	3	2
Span Length	39.0 Feet	31.5 Feet
a) Girders		
Girders per Span	0	0
Girder Length	0.0 Feet	0.0 Feet
Total Girder Length	0.0 Feet	
b) Diaphragms		
Width	0.0 Inches	
Depth	0.0 Inches	
Length	0.0 Feet	
Volume	0.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	22.0 Inches	
Length	180.0 Feet	
Volume	1045.0 CYrds	
d) Traffic Barrier		
Total Length	720.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	5440.0 LF x	$40	=	$217,600
Substructure Concrete	128.3 CY x	$425	=	$54,506
Superstructure Concrete	1045.0 CY x	$425	=	$444,125
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	720.0 LF x	$40	=	$28,800
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$896,331**
	COST PER SF		=	**$58.24**

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TABLE II-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=50 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	180.0 Feet	
Number of Spans	2 @ and	2 @
and Span Length(s)	50.0 Feet	40.0 Feet
Superstructure Type	Flat Slab,	28.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	10		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5760 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	833.2
Depth	27.0 Inches	LL=	315.9
Length	42.8 Feet		
Volume	106.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	376.0
Depth	0.0 Feet	LL=	149.0
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	2	2
Span Length	50.0 Feet	40.0 Feet
a) Girders		
Girders per Span	0	0
Girder Length	0.0 Feet	0.0 Feet
Total Girder Length	0.0 Feet	
b) Diaphragms		
Width	0.0 Inches	
Depth	0.0 Inches	
Length	0.0 Feet	
Volume	0.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	28.0 Inches	
Length	180.0 Feet	
Volume	1330.0 CYrds	
d) Traffic Barrier		
Total Length	720.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	5760.0 LF x	$40	=	$230,400
Substructure Concrete	106.9 CY x	$425	=	$45,422
Superstructure Concrete	1330.0 CY x	$425	=	$565,250
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	720.0 LF x	$40	=	$28,800
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
		TOTAL COST	=	**$1,021,172**
		COST PER SF	=	**$66.35**

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TABLE II-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=45 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	180.0 Feet	
Number of Spans	4 @	
and Span Length(s)	45.0 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	10		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	3840 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	378.6
Depth	27.0 Inches	LL=	307.8
Length	42.8 Feet		
Total Volume	106.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	246.2
Depth	4.0 Feet	LL=	153.9
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	4		
Span Length	45.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	44.3 Feet		
Total Girder Length	1770.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	40.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	180.0 Feet		
Total Volume	380.0 CYrds		
d) Traffic Barrier			
Total Length	720.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	3840.0 LF x	$40	=	$153,600
Substructure Concrete	141.7 CY x	$425	=	$60,218
Superstructure Concrete	420.0 CY x	$425	=	$178,500
Prestressed Girders	1770.0 LF x	$45	=	$79,650
Traffic Railing	720.0 LF x	$40	=	$28,800
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$652,068**
	COST PER SF		=	**$42.37**

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TABLE II-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=60 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	180.0 Feet	
Number of Spans	3 @	
and Span Length(s)	60.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	8		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	3520 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	548.4
Depth	27.0 Inches	LL=	328.3
Length	42.8 Feet		
Total Volume	85.5 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	342.9
Depth	5.0 Feet	LL=	164.2
Length	62.8 Feet		
Total Volume	46.5 CYrds		

2.2 Superstructure

Number of Spans	3		
Span Length	60.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	59.3 Feet		
Total Girder Length	1777.5 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	38.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	180.0 Feet		
Total Volume	380.0 CYrds		
d) Traffic Barrier			
Total Length	720.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	3520.0 LF x	$40	=	$140,800
Substructure Concrete	132.0 CY x	$425	=	$56,092
Superstructure Concrete	418.0 CY x	$425	=	$177,650
Prestressed Girders	1777.5 LF x	$70	=	$124,425
Traffic Railing	720.0 LF x	$40	=	$28,800
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$679,067**
	COST PER SF		=	**$44.12**

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TABLE II-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=90 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	180.0 Feet	
Number of Spans	2 @	
and Span Length(s)	90.0 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	6		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	5 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	3360 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	900.4
Depth	27.0 Inches	LL=	348.3
Length	42.8 Feet		
Total Volume	64.1 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	525.3
Depth	5.5 Feet	LL=	174.2
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	2		
Span Length	90.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	89.3 Feet		
Total Girder Length	1785.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	30.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	180.0 Feet		
Total Volume	380.0 CYrds		
d) Traffic Barrier			
Total Length	720.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	3360.0 LF x	$40	=	$134,400
Substructure Concrete	116.9 CY x	$425	=	$49,676
Superstructure Concrete	410.0 CY x	$425	=	$174,250
Prestressed Girders	1785.0 LF x	$100	=	$178,500
Traffic Railing	720.0 LF x	$40	=	$28,800
Expansion Joints	171.0 LF x	$300	=	$51,300
Structure Demolition	LS			$100,000
	TOTAL COST		=	**$716,926**
	COST PER SF		=	**$46.58**

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TABLE III-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=32.5 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	520.0 Feet	
Number of Spans	16 @	
and Span Length(s)	32.5 Feet	
Superstructure Type	Flat Slab,	18.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	34		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	13440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	383.1
Depth	27.0 Inches	LL=	278.6
Length	42.8 Feet		
Volume	363.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	226.8
Depth	0.0 Feet	LL=	139.3
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	16
Span Length	32.5 Feet
a) Girders	
Girders per Span	0
Girder Length	0.0 Feet
Total Girder Length	0.0 Feet
b) Diaphragms	
Width	0.0 Inches
Depth	0.0 Inches
Length	0.0 Feet
Volume	0.0 CYrds
c) Deck	
Width	85.5 Feet
Depth	18.0 Inches
Length	520.0 Feet
Volume	2470.0 CYrds
d) Traffic Barrier	
Total Length	2080.0 Feet
e) Expansion Joints	
Total Length	427.5 Feet

3.0 COST ESTIMATE

Piles	13440 LF	x	$40	=	$537,600
Substructure Concrete	363.4 CY	x	$425	=	$154,434
Superstructure Concrete	2470.0 CY	x	$425	=	$1,049,750
Prestressed Girders	0.0 LF	x	$0	=	$0
Traffic Railing	2080.0 LF	x	$40	=	$83,200
Expansion Joints	427.5 LF	x	$300	=	$128,250
Structure Demolition	LS				$1,000
			TOTAL COST	=	**$1,954,234**
			COST PER SF	=	**$43.95**

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TABLE III-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=40 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	520.0 Feet	
Number of Spans	13 @	
and Span Length(s)	40.0 Feet	
Superstructure Type	Flat Slab,	22.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	28		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	13120 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	547.0
Depth	27.0 Inches	LL=	298.1
Length	42.8 Feet		
Volume	299.3 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	311.8
Depth	0.0 Feet	LL=	149.0
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	13
Span Length	40.0 Feet
a) Girders	
Girders per Span	0
Girder Length	0.0 Feet
Total Girder Length	0.0 Feet
b) Diaphragms	
Width	0.0 Inches
Depth	0.0 Inches
Length	0.0 Feet
Volume	0.0 CYrds
c) Deck	
Width	85.5 Feet
Depth	22.0 Inches
Length	520.0 Feet
Volume	3018.9 CYrds
d) Traffic Barrier	
Total Length	2080.0 Feet
e) Expansion Joints	
Total Length	342.0 Feet

3.0 COST ESTIMATE

Piles	13120 LF x	$40	=	$524,800
Substructure Concrete	299.3 CY x	$425	=	$127,181
Superstructure Concrete	3018.9 CY x	$425	=	$1,283,028
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	2080.0 LF x	$40	=	$83,200
Expansion Joints	342.0 LF x	$300	=	$102,600
Structure Demolition	LS			$1,000
	TOTAL COST		=	$2,121,809
	COST PER SF		=	$47.72

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TABLE III-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for FLAT SLAB (L=52 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	520.0 Feet	
Number of Spans	10 @	
and Span Length(s)	52.0 Feet	
Superstructure Type	Flat Slab,	28.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	22		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	13440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	864.8
Depth	27.0 Inches	LL=	319.1
Length	42.8 Feet		
Volume	235.1 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	0.0 Inches	DL=	475.8
Depth	0.0 Feet	LL=	159.6
Length	0.0 Feet		
Volume	0.0 CYrds		

2.2 Superstructure

Number of Spans	10
Span Length	52.0 Feet
a) Girders	
Girders per Span	0
Girder Length	0.0 Feet
Total Girder Length	0.0 Feet
b) Diaphragms	
Width	0.0 Inches
Depth	0.0 Inches
Length	0.0 Feet
Volume	0.0 CYrds
c) Deck	
Width	85.5 Feet
Depth	28.0 Inches
Length	520.0 Feet
Volume	3842.2 CYrds
d) Traffic Barrier	
Total Length	2080.0 Feet
e) Expansion Joints	
Total Length	256.5 Feet

3.0 COST ESTIMATE

Piles	13440 LF x	$40	=	$537,600
Substructure Concrete	235.1 CY x	$425	=	$99,928
Superstructure Concrete	3842.2 CY x	$425	=	$1,632,944
Prestressed Girders	0.0 LF x	$0	=	$0
Traffic Railing	2080.0 LF x	$40	=	$83,200
Expansion Joints	256.5 LF x	$500	=	$128,250
Structure Demolition	LS			$1,000
		TOTAL COST	=	$2,482,923
		COST PER SF	=	$55.85

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TABLE III-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=52 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	520.0 Feet	
Number of Spans	10 @	
and Span Length(s)	52.0 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	22		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	8640 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	447.7
Depth	27.0 Inches	LL=	319.1
Length	42.8 Feet		
Total Volume	235.1 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	280.7
Depth	4.0 Feet	LL=	159.6
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	10		
Span Length	52.0 Feet		
a) Girders			
Girders per Span	6 @	7.25 Feet	
Girder Length	51.3 Feet		
Total Girder Length	6150.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.3 Feet		
Total Volume	100.7 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	520.0 Feet		
Total Volume	1097.8 CYrds		
d) Traffic Barrier			
Total Length	2080.0 Feet		
e) Expansion Joints			
Total Length	256.5 Feet		

3.0 COST ESTIMATE

Piles	8640 LF x	$40	=	$345,600
Substructure Concrete	269.9 CY x	$425	=	$114,724
Superstructure Concrete	1198.5 CY x	$425	=	$509,351
Prestressed Girders	6150.0 LF x	$45	=	$276,750
Traffic Railing	2080.0 LF x	$40	=	$83,200
Expansion Joints	256.5 LF x	$500	=	$128,250
Structure Demolition	LS			$1,000
	TOTAL COST		=	$1,458,875
	COST PER SF		=	$32.81

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TABLE III-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=65 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	520.0 Feet	
Number of Spans	8 @	
and Span Length(s)	65.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	18		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	8320 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	588.5
Depth	27.0 Inches	LL=	333.2
Length	42.8 Feet		
Total Volume	192.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	363.0
Depth	5.0 Feet	LL=	166.6
Length	62.8 Feet		
Total Volume	46.5 CYrds		

2.2 Superstructure

Number of Spans	8		
Span Length	65.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	64.3 Feet		
Total Girder Length	5140.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	101.3 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	520.0 Feet		
Total Volume	1097.8 CYrds		
d) Traffic Barrier			
Total Length	2080.0 Feet		
e) Expansion Joints			
Total Length	256.5 Feet		

3.0 COST ESTIMATE

Piles	8320 LF x	$40	=	$332,800
Substructure Concrete	238.9 CY x	$425	=	$101,514
Superstructure Concrete	1199.1 CY x	$425	=	$509,622
Prestressed Girders	5140.0 LF x	$70	=	$359,800
Traffic Railing	2080.0 LF x	$40	=	$83,200
Expansion Joints	256.5 LF x	$500	=	$128,250
Structure Demolition	LS			$1,000
		TOTAL COST	=	**$1,516,186**
		COST PER SF	=	**$34.10**

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TABLE III-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=86.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	520.0 Feet	
Number of Spans	6 @	
and Span Length(s)	86.7 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	14		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	5 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	8480 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	869.7
Depth	27.0 Inches	LL=	347.0
Length	42.8 Feet		
Total Volume	149.6 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	503.5
Depth	5.0 Feet	LL=	173.5
Length	62.8 Feet		
Total Volume	46.5 CYrds		

2.2 Superstructure

Number of Spans	6		
Span Length	86.7 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	85.9 Feet		
Total Girder Length	5155.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	90.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	520.0 Feet		
Total Volume	1097.8 CYrds		
d) Traffic Barrier			
Total Length	2080.0 Feet		
e) Expansion Joints			
Total Length	256.5 Feet		

3.0 COST ESTIMATE

Piles	8480 LF x	$40	=	$339,200
Substructure Concrete	196.1 CY x	$425	=	$83,345
Superstructure Concrete	1187.8 CY x	$425	=	$504,806
Prestressed Girders	5155.0 LF x	$100	=	$515,500
Traffic Railing	2080.0 LF x	$40	=	$83,200
Expansion Joints	256.5 LF x	$500	=	$128,250
Structure Demolition	LS			$1,000
	TOTAL COST		=	**$1,655,301**
	COST PER SF		=	**$37.23**

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Option 2
see page 12

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TABLE IV-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=40 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	8 @	
and Span Length(s)	40.0 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	18		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	7040 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	343.4
Depth	27.0 Inches	LL=	298.1
Length	42.8 Feet		
Total Volume	192.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	228.6
Depth	4.0 Feet	LL=	149.0
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	8		
Span Length	40.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	39.3 Feet		
Total Girder Length	3140.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	80.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	320.0 Feet		
Total Volume	675.6 CYrds		
d) Traffic Barrier			
Total Length	1280.0 Feet		
e) Expansion Joints			
Total Length	256.5 Feet		

3.0 COST ESTIMATE

Piles	7040.0 LF x	$40	=	$281,600
Substructure Concrete	227.2 CY x	$425	=	$96,556
Superstructure Concrete	755.6 CY x	$425	=	$321,111
Prestressed Girders	3140.0 LF x	$42	=	$131,880
Traffic Railing	1280.0 LF x	$40	=	$51,200
Expansion Joints	256.5 LF x	$300	=	$76,950
Earthwork	LS			$313,200
Structure Demolition	LS			$150,000
	TOTAL COST		=	$1,422,497
	COST PER SF		=	$51.99

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TABLE IV-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=45.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	7 @	
and Span Length(s)	45.7 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	16		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	6240 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	383.6
Depth	27.0 Inches	LL=	309.4
Length	42.8 Feet		
Total Volume	171.0 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	248.7
Depth	4.0 Feet	LL=	154.7
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	7	
Span Length	45.7 Feet	
a) Girders		
Girders per Span	5 @	9.00 Feet
Girder Length	45.0 Feet	
Total Girder Length	3147.5 Feet	
b) Diaphragms (2 @ interior bents)		
Width	9.0 Inches	
Depth	30.0 Inches	
Length	36.0 Feet	
Total Volume	70.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	8.0 Inches	
Length	320.0 Feet	
Total Volume	675.6 CYrds	
d) Traffic Barrier		
Total Length	1280.0 Feet	
e) Expansion Joints		
Total Length	256.5 Feet	

3.0 COST ESTIMATE

Piles	6240.0 LF x	$40	=	$249,600
Substructure Concrete	205.8 CY x	$425	=	$87,471
Superstructure Concrete	745.6 CY x	$425	=	$316,859
Prestressed Girders	3147.5 LF x	$45	=	$141,637
Traffic Railing	1280.0 LF x	$40	=	$51,200
Expansion Joints	256.5 LF x	$300	=	$76,950
Earthwork	LS			$313,200
Structure Demolition	LS			$150,000
	TOTAL COST		=	**$1,386,917**
	COST PER SF		=	**$50.69**

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TABLE IV-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=53.3 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	6 @	
and Span Length(s)	53.3 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	14		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	457.5
Depth	27.0 Inches	LL=	320.5
Length	42.8 Feet		
Total Volume	149.6 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	285.7
Depth	4.0 Feet	LL=	160.2
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	6		
Span Length	53.3 Feet		
a) Girders			
Girders per Span	6 @	7.25 Feet	
Girder Length	52.6 Feet		
Total Girder Length	3786.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.3 Feet		
Total Volume	60.4 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	320.0 Feet		
Total Volume	675.6 CYrds		
d) Traffic Barrier			
Total Length	1280.0 Feet		
e) Expansion Joints			
Total Length	256.5 Feet		

3.0 COST ESTIMATE

Piles	5440.0 LF x	$40	=	$217,600
Substructure Concrete	184.4 CY x	$425	=	$78,387
Superstructure Concrete	736.0 CY x	$425	=	$312,788
Prestressed Girders	3786.0 LF x	$45	=	$170,370
Traffic Railing	1280.0 LF x	$40	=	$51,200
Expansion Joints	256.5 LF x	$300	=	$76,950
Earthwork	LS			$313,200
Structure Demolition	LS			$150,000
		TOTAL COST	=	$1,370,495
		COST PER SF	=	$50.09

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TABLE IV-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=64 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	5 @	
and Span Length(s)	64.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	12		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	580.5
Depth	27.0 Inches	LL=	332.1
Length	42.8 Feet		
Total Volume	128.3 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	356.5
Depth	4.8 Feet	LL=	166.1
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	5		
Span Length	64.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	63.3 Feet		
Total Girder Length	3162.5 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	63.3 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	320.0 Feet		
Total Volume	675.6 CYrds		
d) Traffic Barrier			
Total Length	1280.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	5440.0	LF	x $40	=	$217,600
Substructure Concrete	172.3	CY	x $425	=	$73,229
Superstructure Concrete	738.9	CY	x $425	=	$314,028
Prestressed Girders	3162.5	LF	x $70	=	$221,375
Traffic Railing	1280.0	LF	x $40	=	$51,200
Expansion Joints	171.0	LF	x $500	=	$85,500
Earthwork		LS			$313,200
Structure Demolition		LS			$150,000
			TOTAL COST	=	$1,426,132
			COST PER SF	=	$52.12

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TABLE IV-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	4 @	
and Span Length(s)	80.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	10		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5760 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	801.4
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	106.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	466.9
Depth	4.8 Feet	LL=	171.7
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	4		
Span Length	80.0 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	4438.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	50.7 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	320.0 Feet		
Total Volume	675.6 CYrds		
d) Traffic Barrier			
Total Length	1280.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	5760.0	LF x	$40	=	$230,400
Substructure Concrete	150.9	CY x	$425	=	$64,145
Superstructure Concrete	726.2	CY x	$425	=	$308,644
Prestressed Girders	4438.0	LF x	$70	=	$310,660
Traffic Railing	1280.0	LF x	$40	=	$51,200
Expansion Joints	171.0	LF x	$500	=	$85,500
Earthwork		LS			$313,200
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$1,513,749**
			COST PER SF	=	**$55.33**

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TABLE IV-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	4 @	
and Span Length(s)	80.0 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	10		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	5 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5920 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	808.2
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	106.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	479.2
Depth	5.5 Feet	LL=	171.7
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	4		
Span Length	80.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	3170.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	60.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	320.0 Feet		
Total Volume	675.6 CYrds		
d) Traffic Barrier			
Total Length	1280.0 Feet		
e) Expansion Joints			
Total Length	171.0 Feet		

3.0 COST ESTIMATE

Piles	5920.0	LF x	$40	=	$236,800
Substructure Concrete	159.6	CY x	$425	=	$67,845
Superstructure Concrete	735.6	CY x	$425	=	$312,611
Prestressed Girders	3170.0	LF x	$95	=	$301,150
Traffic Railing	1280.0	LF x	$40	=	$51,200
Expansion Joints	171.0	LF x	$500	=	$85,500
Earthwork		LS			$313,200
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$1,518,306**
			COST PER SF	=	**$55.49**

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TABLE IV-G
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=106.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Feet	
Number of Spans	3 @	
and Span Length(s)	106.7 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	8		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	10 and	6 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	5760 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	1228.2
Depth	27.0 Inches	LL=	354.9
Length	42.8 Feet		
Total Volume	85.5 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	689.2
Depth	5.5 Feet	LL=	177.4
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	3	
Span Length	106.7 Feet	
a) Girders		
Girders per Span	7 @	6.00 Feet
Girder Length	105.9 Feet	
Total Girder Length	4448.5 Feet	
b) Diaphragms (2 @ interior bents)		
Width	9.0 Inches	
Depth	45.0 Inches	
Length	36.0 Feet	
Total Volume	45.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	8.0 Inches	
Length	320.0 Feet	
Total Volume	675.6 CYrds	
d) Traffic Barrier		
Total Length	1280.0 Feet	
e) Expansion Joints		
Total Length	171.0 Feet	

3.0 COST ESTIMATE

Piles	5760.0 LF x	$40	=	$230,400
Substructure Concrete	138.3 CY x	$425	=	$58,760
Superstructure Concrete	720.6 CY x	$425	=	$306,236
Prestressed Girders	4448.5 LF x	$100	=	$444,850
Traffic Railing	1280.0 LF x	$40	=	$51,200
Expansion Joints	171.0 LF x	$500	=	$85,500
Earthwork	LS			$313,200
Structure Demolition	LS			$150,000
	TOTAL COST		=	$1,640,146
	COST PER SF		=	$59.95

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TABLE IV-H
QUANTITY CALCULATION AND COST ESTIMATE

4.0 EARTH WORK

Area of Old Section	400.0 SqFeet			
Area of New Section	1500.0 SqFeet			
Length of Old Fill	1920.0 Feet			
Length of New Fill	1920.0 Feet			
Old Fill to be Excavated	0.0 Feet			
Amount of Excavation	0 CYrds			
Amount of New Fill	78300 CYrds			
Earth Work Cost				
Excavation	0 CY x	$3.00	=	$0
New Embankment	78300 CY x	$4.00	=	$313,200
	TOTAL COST		=	$313,200

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TABLE V-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=40 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	8 @ and	56 @
and Span Length(s)	40.0 Feet	40.0 Feet
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	9 and	57	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	26080 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	343.4
Depth	27.0 Inches	LL=	298.1
Length	42.8 Feet		
Total Volume	705.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	228.6
Depth	4.0 Feet	LL=	149.0
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	8 and	56	
Span Length	40.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	39.3 Feet		
Total Girder Length	25120.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	155.0 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	769.5 Feet		

3.0 COST ESTIMATE

Piles	26080 LF x	$40	=	$1,043,200
Substructure Concrete	740.2 CY x	$425	=	$314,581
Superstructure Concrete	2857.2 CY x	$425	=	$1,214,319
Prestressed Girders	25120 LF x	$42	=	$1,055,040
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	769.5 LF x	$300	=	$230,850
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
		TOTAL COST	=	$4,312,390
		COST PER SF	=	$39.40

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TABLE V-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=45.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	7 @ and	49 @
and Span Length(s)	45.7 Feet	45.7 Feet
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	8 and	50	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	22880 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	383.6
Depth	27.0 Inches	LL=	309.4
Length	42.8 Feet		
Total Volume	619.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	248.7
Depth	4.0 Feet	LL=	154.7
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	7 and	49	
Span Length	45.7 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	45.0 Feet		
Total Girder Length	25179.8 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	135.0 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	769.5 Feet		

3.0 COST ESTIMATE

Piles	22880 LF x	$40	=	$915,200
Substructure Concrete	654.7 CY x	$425	=	$278,243
Superstructure Concrete	2837.2 CY x	$425	=	$1,205,812
Prestressed Girders	25180 LF x	$45	=	$1,133,093
Traffic Railing	5120.0 LF x	$40	=	$204,799
Expansion Joints	769.5 LF x	$300	=	$230,850
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
		TOTAL COST	=	$4,217,597
		COST PER SF	=	$38.54

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TABLE V-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=53.3 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	6 @ and	42 @
and Span Length(s)	53.3 Feet	53.3 Feet
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	7 and	43	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	19680 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	457.5
Depth	27.0 Inches	LL=	320.5
Length	42.8 Feet		
Total Volume	534.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	285.7
Depth	4.0 Feet	LL=	160.2
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	6 and	42	
Span Length	53.3 Feet		
a) Girders			
Girders per Span	6 @	7.25 Feet	
Girder Length	52.6 Feet		
Total Girder Length	30288.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.3 Feet		
Total Volume	115.8 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	769.5 Feet		

3.0 COST ESTIMATE

Piles	19680 LF x	$40	=	$787,200
Substructure Concrete	569.2 CY x	$425	=	$241,906
Superstructure Concrete	2818.0 CY x	$425	=	$1,197,659
Prestressed Girders	30288 LF x	$45	=	$1,362,960
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	769.5 LF x	$300	=	$230,850
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
		TOTAL COST	=	$4,274,974
		COST PER SF	=	$39.06

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TABLE V-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=64 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	5 @ and	35 @
and Span Length(s)	64.0 Feet	64.0 Feet
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	6 and	36	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	19520 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	580.5
Depth	27.0 Inches	LL=	332.1
Length	42.8 Feet		
Total Volume	448.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	356.5
Depth	4.8 Feet	LL=	166.1
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	5 and	35	
Span Length	64.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	63.3 Feet		
Total Girder Length	25300.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	120.3 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	684.0 Feet		

3.0 COST ESTIMATE

Piles	19520 LF x	$40	=	$780,800
Substructure Concrete	492.9 CY x	$425	=	$209,495
Superstructure Concrete	2822.6 CY x	$425	=	$1,199,586
Prestressed Girders	25300 LF x	$70	=	$1,771,000
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	684.0 LF x	$500	=	$342,000
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
	TOTAL COST		=	$4,757,281
	COST PER SF		=	$43.47

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TABLE V-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	4 @ and	28 @
and Span Length(s)	80.0 Feet	80.0 Feet
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	5 and	29	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	20480 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	801.4
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	363.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	466.9
Depth	4.8 Feet	LL=	171.7
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	4 and	28	
Span Length	80.0 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	35504.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	95.0 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	513.0 Feet		

3.0 COST ESTIMATE

Piles	20480 LF x	$40	=	$819,200
Substructure Concrete	407.4 CY x	$425	=	$173,157
Superstructure Concrete	2797.2 CY x	$425	=	$1,188,819
Prestressed Girders	35504 LF x	$70	=	$2,485,280
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	513.0 LF x	$500	=	$256,500
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
	TOTAL COST		=	$5,377,356
	COST PER SF		=	$49.14

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TABLE V-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	4 @ and	28 @
and Span Length(s)	80.0 Feet	80.0 Feet
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	5 and	29	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	5 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	20800 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	808.2
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	363.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	479.2
Depth	5.5 Feet	LL=	171.7
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	4 and	28	
Span Length	80.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	25360.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	112.5 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	513.0 Feet		

3.0 COST ESTIMATE

Piles	20800 LF x	$40	=	$832,000
Substructure Concrete	416.1 CY x	$425	=	$176,857
Superstructure Concrete	2814.7 CY x	$425	=	$1,196,257
Prestressed Girders	25360 LF x	$95	=	$2,409,200
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	513.0 LF x	$500	=	$256,500
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
		TOTAL COST	=	$5,325,214
		COST PER SF	=	$48.66

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TABLE V-G
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=106.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	320.0 Ft and	2240.0 Feet
Number of Spans	3 @ and	21 @
and Span Length(s)	106.7 Feet	106.7 Feet
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	4 and	22	
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	10 and	6 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	19520 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	1228.2
Depth	27.0 Inches	LL=	354.9
Length	42.8 Feet		
Total Volume	277.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	689.2
Depth	5.5 Feet	LL=	177.4
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	3 and	21	
Span Length	106.7 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	105.9 Feet		
Total Girder Length	35588.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	82.5 CYrds		
c) Deck			
Width	42.8 Feet		
Depth	8.0 Inches		
Length	320.0 and	2240.0 Feet	
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	427.5 Feet		

3.0 COST ESTIMATE

Piles	19520 LF x	$40	=	$780,800
Substructure Concrete	330.6 CY x	$425	=	$140,520
Superstructure Concrete	2784.7 CY x	$425	=	$1,183,507
Prestressed Girders	35588 LF x	$100	=	$3,558,800
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	427.5 LF x	$500	=	$213,750
Earthwork	LS			$99,600
Structure Demolition	LS			$150,000
	TOTAL COST		=	$6,331,776
	COST PER SF		=	$57.86

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TABLE V-H
QUANTITY CALCULATION AND COST ESTIMATE

4.0 EARTH WORK

Area of Old Section	400.0 SqFeet			
Area of New Section	750.0 SqFeet			
Length of Old Fill	1920.0 Feet			
Length of New Fill	1920.0 Feet			
Old Fill to be Excavated	0.0 Feet			
Amount of Excavation	0 CYrds			
Amount of New Fill	24900 CYrds			
Earth Work Cost				
Excavation	0 CY x	$3.00	=	$0
New Embankment	24900 CY x	$4.00	=	$99,600
	TOTAL COST			$99,600

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TABLE VI-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=40 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	32 @	
and Span Length(s)	40.0 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	66		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	26240 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	343.4
Depth	27.0 Inches	LL=	298.1
Length	42.8 Feet		
Total Volume	705.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	228.6
Depth	4.0 Feet	LL=	149.0
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	32		
Span Length	40.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	39.3 Feet		
Total Girder Length	12560.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	320.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	1280.0 Feet		
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	769.5 Feet		

3.0 COST ESTIMATE

Piles	26240 LF x	$40	=	$1,049,600
Substructure Concrete	740.2 CY x	$425	=	$314,581
Superstructure Concrete	3022.2 CY x	$425	=	$1,284,444
Prestressed Girders	12560 LF x	$42	=	$527,520
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	769.5 LF x	$300	=	$230,850
Earthwork	LS			$142,500
Structure Demolition	LS			$150,000
	TOTAL COST		=	$3,904,295
	COST PER SF		=	$35.68

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TABLE VI-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=45.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	28 @	
and Span Length(s)	45.7 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	58		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	23040 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	383.6
Depth	27.0 Inches	LL=	309.4
Length	42.8 Feet		
Total Volume	619.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	248.7
Depth	4.0 Feet	LL=	154.7
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	28		
Span Length	45.7 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	45.0 Feet		
Total Girder Length	12590.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	280.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	1280.0 Feet		
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	684.0 Feet		

3.0 COST ESTIMATE

Piles	23040	LF x	$40	=	$921,600
Substructure Concrete	654.7	CY x	$425	=	$278,243
Superstructure Concrete	2982.2	CY x	$425	=	$1,267,445
Prestressed Girders	12590	LF x	$45	=	$566,550
Traffic Railing	5120.0	LF x	$40	=	$204,800
Expansion Joints	684.0	LF x	$300	=	$205,200
Earthwork		LS			$142,500
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$3,736,338**
			COST PER SF	=	**$34.14**

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TABLE VI-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=53.3 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	24 @	
and Span Length(s)	53.3 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	50		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	19840 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	457.5
Depth	27.0 Inches	LL=	320.5
Length	42.8 Feet		
Total Volume	534.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	285.7
Depth	4.0 Feet	LL=	160.2
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	24		
Span Length	53.3 Feet		
a) Girders			
Girders per Span	6 @	7.25 Feet	
Girder Length	52.6 Feet		
Total Girder Length	15144.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.3 Feet		
Total Volume	241.7 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	1280.0 Feet		
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	598.5 Feet		

3.0 COST ESTIMATE

Piles	19840 LF x	$40	=	$793,600
Substructure Concrete	569.2 CY x	$425	=	$241,906
Superstructure Concrete	2943.9 CY x	$425	=	$1,251,153
Prestressed Girders	15144 LF x	$45	=	$681,480
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	598.5 LF x	$300	=	$179,550
Earthwork	LS			$142,500
Structure Demolition	LS			$150,000
	TOTAL COST		=	$3,644,988
	COST PER SF		=	$33.31

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TABLE VI-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=64 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	20 @	
and Span Length(s)	64.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	42		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	19840 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	580.5
Depth	27.0 Inches	LL=	332.1
Length	42.8 Feet		
Total Volume	448.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	356.5
Depth	4.8 Feet	LL=	166.1
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	20		
Span Length	64.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	63.3 Feet		
Total Girder Length	12650.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	253.3 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	1280.0 Feet		
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	513.0 Feet		

3.0 COST ESTIMATE

Piles	19840	LF x	$40	=	$793,600
Substructure Concrete	492.9	CY x	$425	=	$209,495
Superstructure Concrete	2955.6	CY x	$425	=	$1,256,111
Prestressed Girders	12650	LF x	$70	=	$885,500
Traffic Railing	5120.0	LF x	$40	=	$204,800
Expansion Joints	513.0	LF x	$500	=	$256,500
Earthwork		LS			$142,500
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$3,898,506**
			COST PER SF	=	**$35.62**

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TABLE VI-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	16 @	
and Span Length(s)	80.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	34		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	21120 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	801.4
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	363.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	466.9
Depth	4.8 Feet	LL=	171.7
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	16		
Span Length	80.0 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	17752.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	202.7 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	1280.0 Feet		
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	427.5 Feet		

3.0 COST ESTIMATE

Piles	21120	LF	x $40	=	$844,800
Substructure Concrete	407.4	CY	x $425	=	$173,157
Superstructure Concrete	2904.9	CY	x $425	=	$1,234,578
Prestressed Girders	17752	LF	x $70	=	$1,242,640
Traffic Railing	5120.0	LF	x $40	=	$204,800
Expansion Joints	427.5	LF	x $500	=	$213,750
Earthwork		LS			$142,500
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$4,206,225**
			COST PER SF	=	**$38.43**

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TABLE VI-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	16 @	
and Span Length(s)	80.0 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	34		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	5 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	21280 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	808.2
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	363.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	479.2
Depth	5.5 Feet	LL=	171.7
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	16		
Span Length	80.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	12680.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	240.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	1280.0 Feet		
Total Volume	2702.2 CYrds		
d) Traffic Barrier			
Total Length	5120.0 Feet		
e) Expansion Joints			
Total Length	427.5 Feet		

3.0 COST ESTIMATE

Piles	21280 LF x	$40	=	$851,200
Substructure Concrete	416.1 CY x	$425	=	$176,857
Superstructure Concrete	2942.2 CY x	$425	=	$1,250,444
Prestressed Girders	12680 LF x	$95	=	$1,204,600
Traffic Railing	5120.0 LF x	$40	=	$204,800
Expansion Joints	427.5 LF x	$500	=	$213,750
Earthwork	LS			$142,500
Structure Demolition	LS			$150,000
		TOTAL COST	=	**$4,194,152**
		COST PER SF	=	**$38.32**

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TABLE VI-G
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=106.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	1280.0 Feet	
Number of Spans	12 @	
and Span Length(s)	106.7 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	26		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	10 and	6 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	20160 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	1228.2
Depth	27.0 Inches	LL=	354.9
Length	42.8 Feet		
Total Volume	277.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	689.2
Depth	5.5 Feet	LL=	177.4
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	12	
Span Length	106.7 Feet	
a) Girders		
Girders per Span	7 @	6.00 Feet
Girder Length	105.9 Feet	
Total Girder Length	17794.0 Feet	
b) Diaphragms (2 @ interior bents)		
Width	9.0 Inches	
Depth	45.0 Inches	
Length	36.0 Feet	
Total Volume	180.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	8.0 Inches	
Length	1280.0 Feet	
Total Volume	2702.2 CYrds	
d) Traffic Barrier		
Total Length	5120.0 Feet	
e) Expansion Joints		
Total Length	342.0 Feet	

3.0 COST ESTIMATE

Piles	20160	LF	x $40	=	$806,400
Substructure Concrete	330.6	CY	x $425	=	$140,520
Superstructure Concrete	2882.2	CY	x $425	=	$1,224,944
Prestressed Girders	17794	LF	x $100	=	$1,779,400
Traffic Railing	5120.0	LF	x $40	=	$204,800
Expansion Joints	342.0	LF	x $500	=	$171,000
Earthwork		LS			$142,500
Structure Demolition		LS			$150,000
			TOTAL COST	=	$4,619,564
			COST PER SF	=	$42.21

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TABLE VI-H
QUANTITY CALCULATION AND COST ESTIMATE

4.0 EARTH WORK

Area of Old Section	400.0 SqFeet			
Area of New Section	1500.0 SqFeet			
Length of Old Fill	1920.0 Feet			
Length of New Fill	960.0 Feet			
Old Fill to be Excavated	960.0 Feet			
Amount of Excavation	14300 CYrds	(To be used in New Fill)		
Amount of New Fill	24900 CYrds			
Earth Work Cost				
Excavation	14300 CY x	$3.00	=	$42,900
New Embankment	24900 CY x	$4.00	=	$99,600
		TOTAL COST		**$142,500**

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TABLE VII-A
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=40 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	56 @	
and Span Length(s)	40.0 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	114		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	45440 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	343.4
Depth	27.0 Inches	LL=	298.1
Length	42.8 Feet		
Total Volume	1218.4 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	228.6
Depth	4.0 Feet	LL=	149.0
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	56		
Span Length	40.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	39.3 Feet		
Total Girder Length	21980.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	560.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	2240.0 Feet		
Total Volume	4728.9 CYrds		
d) Traffic Barrier			
Total Length	8960.0 Feet		
e) Expansion Joints			
Total Length	1282.5 Feet		

3.0 COST ESTIMATE

Piles	45440 LF x	$40	=	$1,817,600
Substructure Concrete	1253.2 CY x	$425	=	$532,606
Superstructure Concrete	5288.9 CY x	$425	=	$2,247,778
Prestressed Girders	21980 LF x	$42	=	$923,160
Traffic Railing	8960.0 LF x	$40	=	$358,400
Expansion Joints	1282.5 LF x	$300	=	$384,750
Earthwork	LS			$85,500
Structure Demolition	LS			$150,000
		TOTAL COST	=	**$6,499,793**
		COST PER SF	=	**$33.94**

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TABLE VII-B
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=45.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	49 @	
and Span Length(s)	45.7 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	100		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	39840 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	383.6
Depth	27.0 Inches	LL=	309.4
Length	42.8 Feet		
Total Volume	1068.8 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	248.7
Depth	4.0 Feet	LL=	154.7
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	49		
Span Length	45.7 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	45.0 Feet		
Total Girder Length	22032.5 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	30.0 Inches		
Length	36.0 Feet		
Total Volume	490.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	2240.0 Feet		
Total Volume	4728.9 CYrds		
d) Traffic Barrier			
Total Length	8960.0 Feet		
e) Expansion Joints			
Total Length	1111.5 Feet		

3.0 COST ESTIMATE

Piles	39840 LF x	$40	=	$1,593,600
Substructure Concrete	1103.6 CY x	$425	=	$469,015
Superstructure Concrete	5218.9 CY x	$425	=	$2,218,028
Prestressed Girders	22033 LF x	$45	=	$991,463
Traffic Railing	8960.0 LF x	$40	=	$358,400
Expansion Joints	1111.5 LF x	$300	=	$333,450
Earthwork	LS			$85,500
Structure Demolition	LS			$150,000
	TOTAL COST		=	$6,199,456
	COST PER SF		=	$32.37

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TABLE VII-C
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE II BEAM (L=53.3 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	42 @	
and Span Length(s)	53.3 Feet	
Superstructure Type	Type II w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	86		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	5 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	34240 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	457.5
Depth	27.0 Inches	LL=	320.5
Length	42.8 Feet		
Total Volume	919.1 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	285.7
Depth	4.0 Feet	LL=	160.2
Length	58.8 Feet		
Total Volume	34.8 CYrds		

2.2 Superstructure

Number of Spans	42	
Span Length	53.3 Feet	
a) Girders		
Girders per Span	6 @	7.25 Feet
Girder Length	52.6 Feet	
Total Girder Length	26502.0 Feet	
b) Diaphragms (2 @ interior bents)		
Width	9.0 Inches	
Depth	30.0 Inches	
Length	36.3 Feet	
Total Volume	422.9 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	8.0 Inches	
Length	2240.0 Feet	
Total Volume	4728.9 CYrds	
d) Traffic Barrier		
Total Length	8960.0 Feet	
e) Expansion Joints		
Total Length	940.5 Feet	

3.0 COST ESTIMATE

Piles	34240	LF x	$40	=	$1,369,600
Substructure Concrete	953.9	CY x	$425	=	$405,424
Superstructure Concrete	5151.8	CY x	$425	=	$2,189,517
Prestressed Girders	26502	LF x	$45	=	$1,192,590
Traffic Railing	8960.0	LF x	$40	=	$358,400
Expansion Joints	940.5	LF x	$300	=	$282,150
Earthwork		LS			$85,500
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$6,033,182**
			COST PER SF	=	**$31.50**

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TABLE VII-D
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=64 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	35 @	
and Span Length(s)	64.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	72		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	6 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	34240 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	580.5
Depth	27.0 Inches	LL=	332.1
Length	42.8 Feet		
Total Volume	769.5 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	356.5
Depth	4.8 Feet	LL=	166.1
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	35		
Span Length	64.0 Feet		
a) Girders			
Girders per Span	5 @	9.00 Feet	
Girder Length	63.3 Feet		
Total Girder Length	22137.5 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	443.3 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	2240.0 Feet		
Total Volume	4728.9 CYrds		
d) Traffic Barrier			
Total Length	8960.0 Feet		
e) Expansion Joints			
Total Length	855.0 Feet		

3.0 COST ESTIMATE

Piles	34240 LF x	$40	=	$1,369,600
Substructure Concrete	813.6 CY x	$425	=	$345,760
Superstructure Concrete	5172.2 CY x	$425	=	$2,198,194
Prestressed Girders	22138 LF x	$70	=	$1,549,625
Traffic Railing	8960.0 LF x	$40	=	$358,400
Expansion Joints	855.0 LF x	$500	=	$427,500
Earthwork	LS			$85,500
Structure Demolition	LS			$150,000
		TOTAL COST	=	**$6,484,580**
		COST PER SF	=	**$33.86**

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TABLE VII-E
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE III BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	28 @	
and Span Length(s)	80.0 Feet	
Superstructure Type	Type III w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	58		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	4 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	36480 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	801.4
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	619.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	466.9
Depth	4.8 Feet	LL=	171.7
Length	62.0 Feet		
Total Volume	44.1 CYrds		

2.2 Superstructure

Number of Spans	28		
Span Length	80.0 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	79.3 Feet		
Total Girder Length	31066.0 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	38.0 Inches		
Length	36.0 Feet		
Total Volume	354.7 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	2240.0 Feet		
Total Volume	4728.9 CYrds		
d) Traffic Barrier			
Total Length	8960.0 Feet		
e) Expansion Joints			
Total Length	684.0 Feet		

3.0 COST ESTIMATE

Piles	36480 LF x	$40	=	$1,459,200
Substructure Concrete	663.9 CY x	$425	=	$282,170
Superstructure Concrete	5083.6 CY x	$425	=	$2,160,511
Prestressed Girders	31066 LF x	$70	=	$2,174,620
Traffic Railing	8960.0 LF x	$40	=	$358,400
Expansion Joints	684.0 LF x	$500	=	$342,000
Earthwork	LS			$85,500
Structure Demolition	LS			$150,000
		TOTAL COST	=	$7,012,401
		COST PER SF	=	$36.61

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TABLE VII-F
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=80 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	28 @	
and Span Length(s)	80.0 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	58		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	8 and	5 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	36640 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	808.2
Depth	27.0 Inches	LL=	343.4
Length	42.8 Feet		
Total Volume	619.9 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	479.2
Depth	5.5 Feet	LL=	171.7
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	28	
Span Length	80.0 Feet	
a) Girders		
Girders per Span	5 @	9.00 Feet
Girder Length	79.3 Feet	
Total Girder Length	22190.0 Feet	
b) Diaphragms (2 @ interior bents)		
Width	9.0 Inches	
Depth	45.0 Inches	
Length	36.0 Feet	
Total Volume	420.0 CYrds	
c) Deck		
Width	85.5 Feet	
Depth	8.0 Inches	
Length	2240.0 Feet	
Total Volume	4728.9 CYrds	
d) Traffic Barrier		
Total Length	8960.0 Feet	
e) Expansion Joints		
Total Length	684.0 Feet	

3.0 COST ESTIMATE

Piles	36640	LF x	$40	=	$1,465,600
Substructure Concrete	672.6	CY x	$425	=	$285,870
Superstructure Concrete	5148.9	CY x	$425	=	$2,188,278
Prestressed Girders	22190	LF x	$95	=	$2,108,050
Traffic Railing	8960.0	LF x	$40	=	$358,400
Expansion Joints	684.0	LF x	$500	=	$342,000
Earthwork		LS			$85,500
Structure Demolition		LS			$150,000
			TOTAL COST	=	**$6,983,697**
			COST PER SF	=	**$36.46**

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TABLE VII-G
QUANTITY CALCULATION AND COST ESTIMATE

1.0 BASIS OF CALCULATIONS for TYPE IV BEAM (L=106.7 FEET)

Roadway Width	80.0 Feet	3 Lanes per Bridge
Overall Deck Width	85.5 Feet (	42.8 Feet per Bridge)
Overall Bridge Length	2240.0 Feet	
Number of Spans	21 @	
and Span Length(s)	106.7 Feet	
Superstructure Type	Type IV w/ Deck	8.0 inches thick
Substructure Type	Pile Bents w/	18.0 –inch piles

2.0 QUANTITY CALCULATIONS

2.1 Substructure

Number of Bents	44		
a) Piles			
Size	18.0 Inches	80 Ton Capacity	
Number per Bent	10 and	6 in end bents	
Length per Pile	80.0 Feet		
Total Pile Length	34560 Feet		
b) Bent Caps		Per Bent:	
Width	36.0 Inches	DL=	1228.2
Depth	27.0 Inches	LL=	354.9
Length	42.8 Feet		
Total Volume	470.3 CYrds		
c) End Bents (Backwall & Wingwalls)		Per End Bent:	
Width	12.0 Inches	DL=	689.2
Depth	5.5 Feet	LL=	177.4
Length	64.8 Feet		
Total Volume	52.8 CYrds		

2.2 Superstructure

Number of Spans	21		
Span Length	106.7 Feet		
a) Girders			
Girders per Span	7 @	6.00 Feet	
Girder Length	105.9 Feet		
Total Girder Length	31139.5 Feet		
b) Diaphragms (2 @ interior bents)			
Width	9.0 Inches		
Depth	45.0 Inches		
Length	36.0 Feet		
Total Volume	315.0 CYrds		
c) Deck			
Width	85.5 Feet		
Depth	8.0 Inches		
Length	2240.0 Feet		
Total Volume	4728.9 CYrds		
d) Traffic Barrier			
Total Length	8960.0 Feet		
e) Expansion Joints			
Total Length	684.0 Feet		

3.0 COST ESTIMATE

Piles	34560 LF x	$40	=	$1,382,400
Substructure Concrete	523.0 CY x	$425	=	$222,279
Superstructure Concrete	5043.9 CY x	$425	=	$2,143,653
Prestressed Girders	31139 LF x	$100	=	$3,113,950
Traffic Railing	8960.0 LF x	$40	=	$358,400
Expansion Joints	684.0 LF x	$500	=	$342,000
Earthwork	LS			$85,500
Structure Demolition	LS			$150,000
	TOTAL COST		=	$7,798,182
	COST PER SF		=	$40.72

S.R. 39 – BRIDGE OVER HILLSBOROUGH RIVER

TABLE VII-H
QUANTITY CALCULATION AND COST ESTIMATE

4.0 EARTH WORK

Area of Old Section	400.0 SqFeet			
Area of New Section	1500.0 SqFeet			
Length of Old Fill	1920.0 Feet			
Length of New Fill	0.0 Feet			
Old Fill to be Excavated	1920.0 Feet			
Amount of Excavation	28500 CYrds			
Amount of New Fill	0 CYrds			
Earth Work Cost				
Excavation	28500 CY x	$3.00	=	$85,500
New Embankment	0 CY x	$4.00	=	$0
	TOTAL COST			$85,500