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STATE HIGHWAY ADMINISTRATION

RESEARCH REPORT

ALTERNATIVE ALIGNMENTS DEVELOPMENT AND EVALUATION FOR THE US 220 PROJECT IN MARYLAND

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16. Abstract This project aims to find the preferred alternative alignments for the Maryland section of existing US 220, using the highway alignment optimization (HAO) model. The model was used to explore alternative alignments within a 4,000 foot-wide buffer of the US 220 from I-68 near Lavale, Maryland to the West Virginia State line near McCoolle, Maryland. It analyzed various alternative alignments within the project limit at a planning level of detail, evaluated them based on important decision criteria, and eventually found the best alternative alignments. Geographical and environmental issues as well as roadway geometric specification are also considered in finding cost-effective alternatives of the US 220. Five major agency costs (i.e., length-dependent, right-of-way, earthwork, bridge, and maintenance costs) are considered as the decision criterion for optimizing alignments. The project was divided into eight sections based on environmental and geographical issues. Among those eight sections, some were classified as the locations where widening of the existing US 220 was preferred (named Case 1 sections) and the others were classified as the locations where development of new bypasses was recommended (Case 2 sections).			
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Executive Summary

This project aims to find the preferred alternative alignments for the Maryland section of existing US 220, using the highway alignment optimization (HAO) model. The model was used to explore alternative alignments within a 4,000 foot-wide buffer of the US 220 from I-68 near Lavale, Maryland to the West Virginia State line near McCooles, Maryland. The project parameters were recommended by the Maryland State Highway Administration (SHA), and the model was used to assist highway planners and designers in finding cost-effective alternatives of the US 220 while considering geographical and environmental issues as well as roadway geometric specification. It analyzed various alternative alignments within the project limit at a planning level of detail, evaluated them based on important decision criteria, and eventually found the best alternative alignments.

Various model input parameters which determine geometry of the proposed roadway and its construction cost (such as the cross-section information, design standards, and unit construction cost) were specified with assistance from SHA's Office of Planning. The model's objective function used in this project includes five major agency costs (i.e., length-dependent, right-of-way, earthwork, bridge, and maintenance costs) which the alignment optimization process takes into account while automatically resolving trade-offs among them. A penalty cost was also employed in the model's objective function to evaluate the environmentally sensitive areas taken by candidate alignments.

The project was divided into eight sections based on environmental and geographical issues within the project area. Among those eight sections, some were classified as the locations where widening of the existing US 220 was preferred (named Case 1 sections) and the others were classified as the locations where development of new bypasses was recommended (Case 2 sections). It is important to note that the HAO model was used to optimize alternative alignments of US 220 for Case 2 sections. The model searched over 300 generations for each of the Case 2 sections, thereby generating and evaluating about 10,000 alternative alignments for each section. The model was also applied to the Case 1 sections to estimate the construction cost of widening the existing US 220. Desktop PCs with Intel® Core™2 Duo and 2 GB RAM were employed to run the HAO model, and it took about 12 hours for optimizing alignments in each Case 2 section. The computation time in this project was relatively long due to the land use complexity and large scale of the project.

The final four alternative alignments were obtained through the combination of all the road segments selected in each section. Among them, Alt2 (combination of Segments A, B, C, D1, E, F2, G and H) is the least cost alternative. It is 94,676 feet (17.93 miles) long and has four highway bridges included. The least cost alternative mostly takes pasture and forest and avoids environmentally sensitive areas (including the protected lands and state parks), high elevation regions, and high land cost areas for its right-of-way. However, this alternative unavoidably affects some residential and commercial areas due to the land use complexity within the project limit. It is important to note that the earthwork cost of the least cost alternative accounts for a significant fraction (about 80%) of its total construction cost. The bridge structures also account for the large fraction of the total cost; however, the fraction of the right-of-way cost is low, because the US 220 project area is mountainous and property values in it are relatively low. Other costs, such as user cost, contingency cost and utility relocation cost, are not considered in this case study, and thus the total cost may be underestimated.

1. Introduction

1.1 Project Objective:

The objective of this project is to provide professional transportation engineering services in finding the preferred alternative alignments for existing US 220. To achieve this objective the highway alignment optimization (HAO) model, previously developed by Morgan State University and University of Maryland, was applied. Based on the experience from previous engineering studies (i.e., US 220 Tier One study, 2006), the Maryland State Highway Administration (SHA) recommended that the model search be limited within the refined corridors (Transportation Scenarios B and D), which are 4,000 foot wide and 18.7 mile long sections from I-68 near Lavale, Maryland to the West Virginia State line (near McCoolle, Maryland).

Using the HAO model, the project team analyzed various alternative alignments within the project limit at a planning level of detail, evaluated them based on important decision criteria (such as, construction cost and environmental impacts), and eventually found best-fit-alternative alignments (BFAs) for the Maryland Section of existing US 220. Various practical and quantitative results of the BFAs (e.g., environmental impacts on the study area, horizontal and vertical alignments, and total cost breakdown of the BFAs) were obtained.

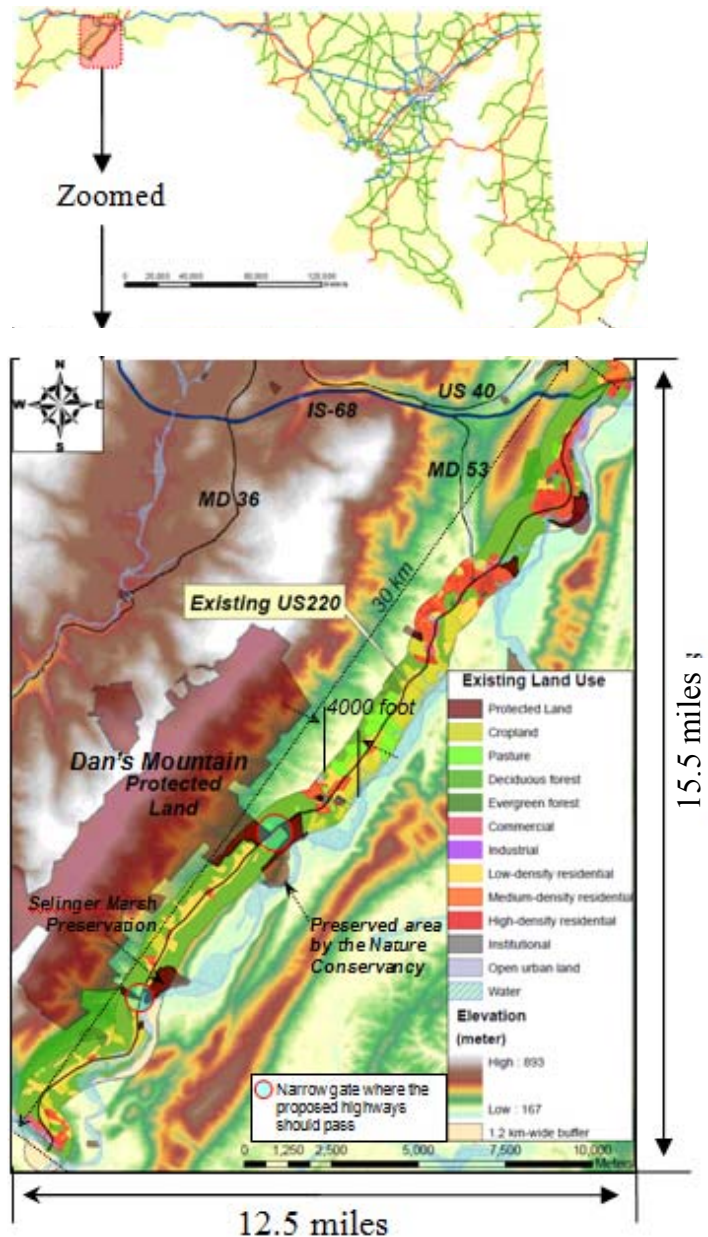


Figure 1: Project Limit (An land-use map overlaid on the top of an elevation map)

1.2 Project Scope:

The project area is located in the Appalachian Mountains, and its ground elevation varies from 590 to 1,630 feet, as shown in Figure 1. The project area includes various land use types (such as agricultural, commercial, industrial, institutional and residential areas); however, it is mostly covered with forest and pasture. In addition, the project area has many geographically sensitive regions (such as floodplains, state parks and wetlands) that must be considered in the highway alternative selection. Many priority funding areas (PFAs) in which project developments are eligible for special tax incentives and state funding are also located in the project area, thus may be favored in selecting highway alternatives.

2. Data preparation

2.1 Data Sources:

The SHA provided various GIS data (such as elevation, land use, and property maps) for use by the HAO model. These GIS data (shown in Table 1) were used to prepare appropriate inputs. Based on those data, four important GIS maps required by the HAO model application were developed:

- Land-Use Map
- Unit Land Cost Map
- Elevation Map
- Geographical Constraints Map

Preparation of input data for the HAO model was completed by both Morgan State University and the University of Maryland. In this task, various spatial data which describe land use, land value, geographical constraints, ground elevation, and priority funding areas (PFA) of the project area were prepared in a GIS data format. Data validation and adjustment were completed at a planning level of detail. The project team not only investigated the geographical constraints that must be avoided but also identified priority funding areas (PFAs) for the project. Note that the spatial constraints and PFAs can be updated if additional information is available in the future.

Table 1: GIS Data Used for the HAO Model Input Preparation

Data Type	Explanation	Source
Polyline	US220 Centerline and its 4000ft buffer	MdProperty View (ATDATA/Images)
Polyline	Roads	MdProperty View (SHA Grid Road Layers)
Polyline	Railways	MdProperty View (SHA Grid Road Layers)
Polygon	Floodplain	MdProperty View (FloodPlains)
Polygon	Public Parks	MdProperty View (CountryPark)
Polygon	Protected & preserved lands	MdProperty View (Overlays/Protland)
Polygon	Priority Funding Area (1997)	MdProperty View (Overlays/SMGR_PFA/ALLEPFA)
Polygon	Land Uses (2002)	MdProperty View (2002 Land Use/Land Cover GIS layer)
Raster	Scanned Maps (for properties digitization)	MdProperty View (ATDATA/Images)
Point	Parcel Points (for calculating unit land costs)	MdProperty View (Alle Parcel Database)
Raster	30m*30m ground elevation	MdProperty View (DEM)

Note that most of GIS data employed in this project were from MdProperty View (2009 edition), a series of jurisdiction level database and image collections from the Maryland Department of Planning.

To estimate and compare the right-of-way cost (i.e., land acquisition cost) of various alternatives, a *Unit Land Cost Map* was developed as an input to the HAO model. The *Unit Land Cost Map* was prepared through the integration of various GIS data shown in Table 1. As the first step of the integration, digitization of important properties (e.g., property boundary and environmentally sensitive areas) in the project area was processed. Various GIS layers were employed to digitize the important features. For example, “MD State Highway Grid GIS” layer from the MdProperty View was used to digitize the roads and rail lines. An image dataset which was named as “ATDATA-Images” in the MdProperty View was also used for the property digitization. Some other features, such as public parks and floodplains, were obtained directly from the GIS data provided by the SHA.

To obtain the unit land value (\$/sq. ft.) of each property in the project area, a GIS point layer in MdProperty View (which stores property boundary, area, total value, ownership, and address information) was used. The point layer and the digitized property map were superimposed and then merged through the “spatial join” process to calculate the unit land cost of each property in the project area.

A 2002 classification of jurisdiction land use/land cover based on a USGS classification scheme was used to classify different land use types in the project area. The land use map of the project area shows more complexity in its northern section due to the dense residential, institutional and commercial areas, while the typical land use in the southern part changes to forests and croplands.

Despite the complex land use in the northern section, the elevation map shows a smooth. Toward the south, the terrain becomes more jagged and mountainous.

The range of the unit cost is also reasonable due to the elevation and land use condition. Most of the high cost properties are located in the northern section where the relatively smoother terrain and the residential land use are accessible.

2.2 HAO Model Input Data:

2.2.1 Land Use Map

Figure 2 shows a land use map developed for this project in which various land use types provided by MdProperty View and three additional types of geographically sensitive regions (i.e., water, floodplains and protected lands) are included. Due to the importance and relevance to the project, some land use types were merged and a total of nine different types were used, as shown in Table 2.

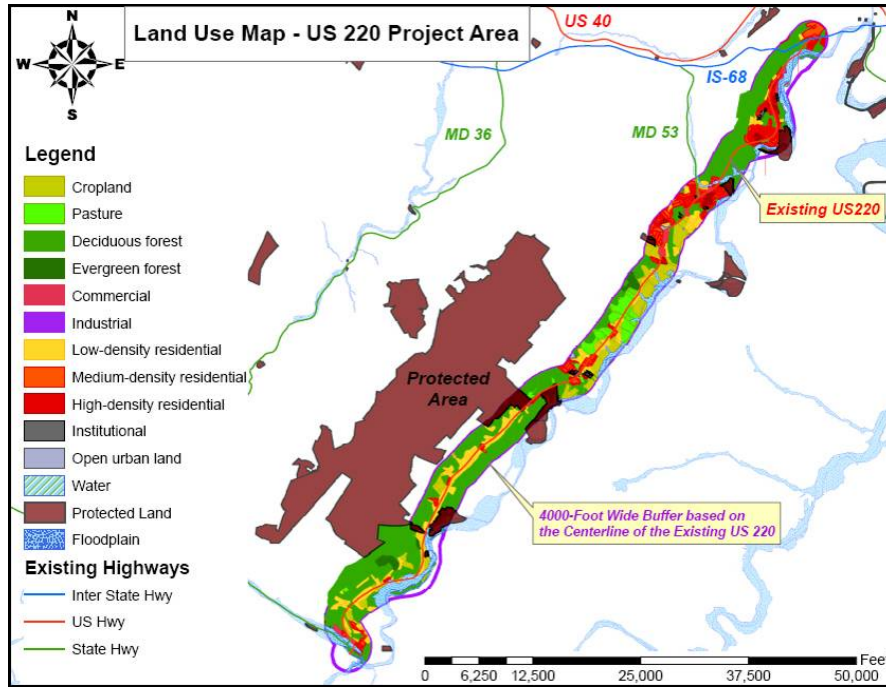


Figure 2: Land Use Map

Table 1: Land Use Classification

Land Use Classification from MdProperty View	Index	HAO Land Use Class
High-density residential	1	Residential
Medium-density residential	2	
Low-density residential	3	
Commercial	4	Commercial
industrial	5	industrial
Institutional	6	Institutional
Water	7	Water
Open urban land	8	Open urban land
Cropland	9	Cropland
Pasture	10	Pasture
Evergreen forest	11	Forest
Deciduous forest	12	

2.2.2 Unit Cost Map

The unit cost of each property is calculated based on the Parcel Database from the MdProperty View. The total value of all parcel points placed in a polygon was divided by the total area of that polygon. The attribute table of the *Unit Cost Map* contains the property ID, unit cost (\$/sq. ft.), perimeter, area, and maximum area allowable to be affected by the preferred alignment. Figure 3 show the final *Unit Cost Map* developed through the data integration with GIS data provided by the SHA.

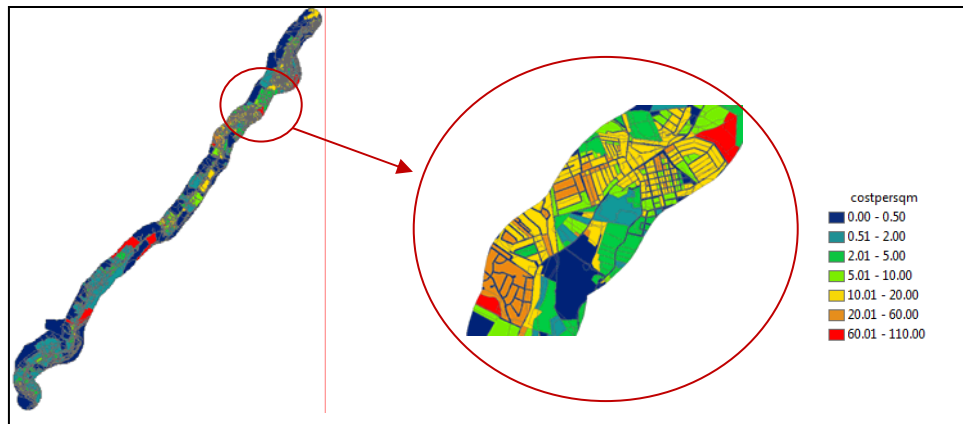


Figure 3: Unit Cost Map

2.2.3 Elevation map

The elevation map is a raster file containing the ground elevation of the study area. This GIS data was used as an input of the HAO model to estimate the earthwork volume and cost of various possible alignments generated from the model. Note that a raster image is a data structure representing a rectangular grid of pixels, viewable via a monitor or other display medium. So, a raster is also called a grid or an image in GIS. The value in each grid cell corresponds to the characteristic of a spatial phenomenon at the cell location. Figure 4 shows the ground elevation maps used in the HAO model in this project.

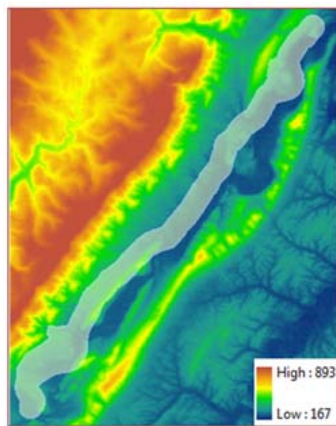


Figure 4(a): 12.5x 15.5 miles Wide Elevation Map as an HAO Model Input

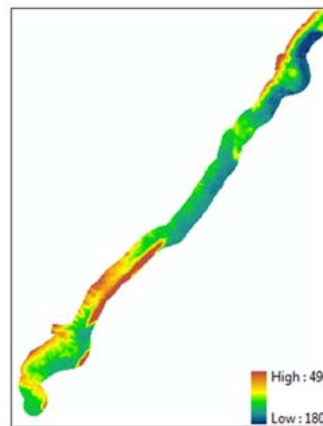


Figure 4(b): Ground Elevation within 4000 Foot Wide Buffer

2.2.4 Geographical Constraints Map

In the project area, many protected lands (on which the impact of the selected highway alignments should be minimized) were identified from the MdProperty View data. These areas should be protected for the jurisdiction based on various federal, State, and local programs as compiled by the Maryland Department of Planning.

The list of “Protected Lands” within the US 220 project limit is as follows:

- *State Park* owned by the Maryland Department of Natural Resources
- A part of *Dan’s Mountain Wildlife Maintenance* area owned by the Maryland Department of Natural Resources
- *Selinger Marsh Preservation* area owned by the Nature Conservancy
Note: the Nature Conservancy is a non-profit organization helping to preserve environmentally sensitive areas in Maryland and Pennsylvania.
- *Exempted areas* owned by the State Roads Commission and the Nature Conservancy
- *Jurisdictional Public Works Property* owned by the Allegany County Commissioners
- *Public County Property* (e.g., Junior Public School including Junior College) owned by the Board of Education, Allegany County

Figure 5 show critical locations in which special care should be exercised in selecting highway alternatives for US 220. Protected lands are located in these

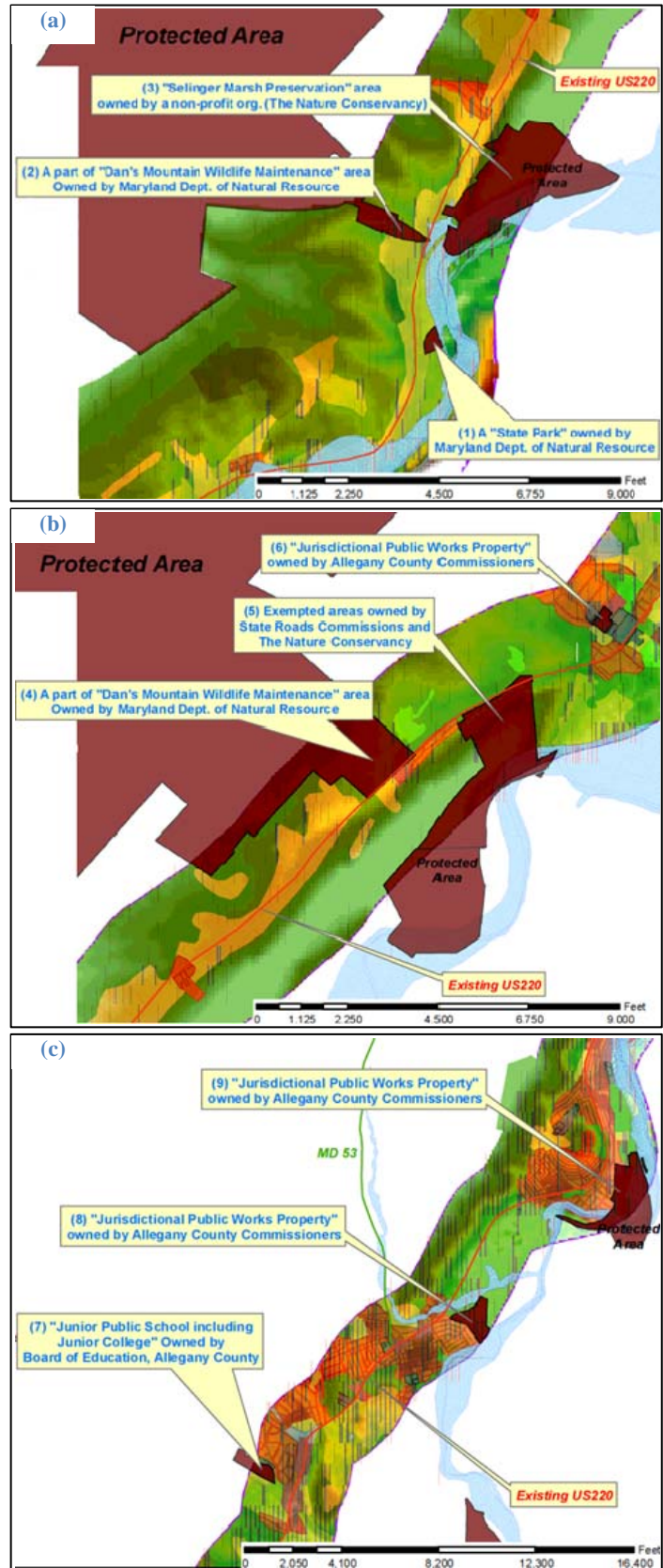


Figure 5: Geographical Constraint Map

areas, and thus the search space of the HAO model can be significantly reduced. Figure 5(a) shows a model search boundary narrowed by State Park, Dan's Mountain Wildlife, and the Selinger Marsh Preservation areas. In this area, widening of the existing US 220 is recommended instead of letting the HAO model search for a new bypass. Figure 5(b) shows another narrow gate of the model search boundary surrounded by Dan's Mountain Wildlife area, exempted areas, and Jurisdictional Public Works Property. Widening of the existing US 220 is also recommended in this area. Figure 5(c) shows the location of other protected lands along the study area. The model search boundary is not significantly affected by these protected lands, and thus searching a new bypass using the HAO model is recommended.

2.3 Experimental Design

Due to the spatial constraints (i.e., protected lands) and complexity of land use in the project area, the highway alternative search space of the HAO model was divided into eight sections (named A, B, C, D, E, F, G, and H). These sections include (1) Case 1 – locations where widening of the existing US 220 is preferred (i.e., sections A, C, E, and H shown in Figure 6) and (2) Case 2 – locations where developing new bypasses is recommended (i.e., sections B, D, F, and G shown in Figure 7). Note that the start and end points of the new bypass in each section (i.e., diverging and merging points of the new bypass from and to existing US 220, respectively) were obtained, by applying the HAO model to the entire section of the study area. The optimization of the alignments for the new bypass and widening of existing US 220 for each section was then conducted.

- Sections A and H are the start and end sections of the project limit where the widening of existing US 220 is recommended due to the complexity in land use and ground elevation. These sections are mostly covered with pastures, forests, and floodplains; however, commercial and high-density residential areas are also located along existing US 220. Furthermore, ground elevation outside the existing US 220 varies greatly. Thus, a new bypass in these areas may incur significantly high land acquisition costs and earthwork costs.
- Sections B, D, F, and G are the locations where development of new bypasses is recommended. Sufficient undeveloped spaces are available, and land use is relatively simpler than others. The HAO model was applied to each section to find the best alternative alignment.
- Sections C and E are the locations where many protected lands (such as State Park, Dan's Mountain Wildlife Maintenance area, and Selinger Marsh Preservation area) complicate the search for a new bypass. Thus, widening of existing US 220 is strongly recommended to minimize the environmental impact. Road construction costs (such as earthwork costs) may also be significantly reduced by widening the existing road instead of building new bypasses.

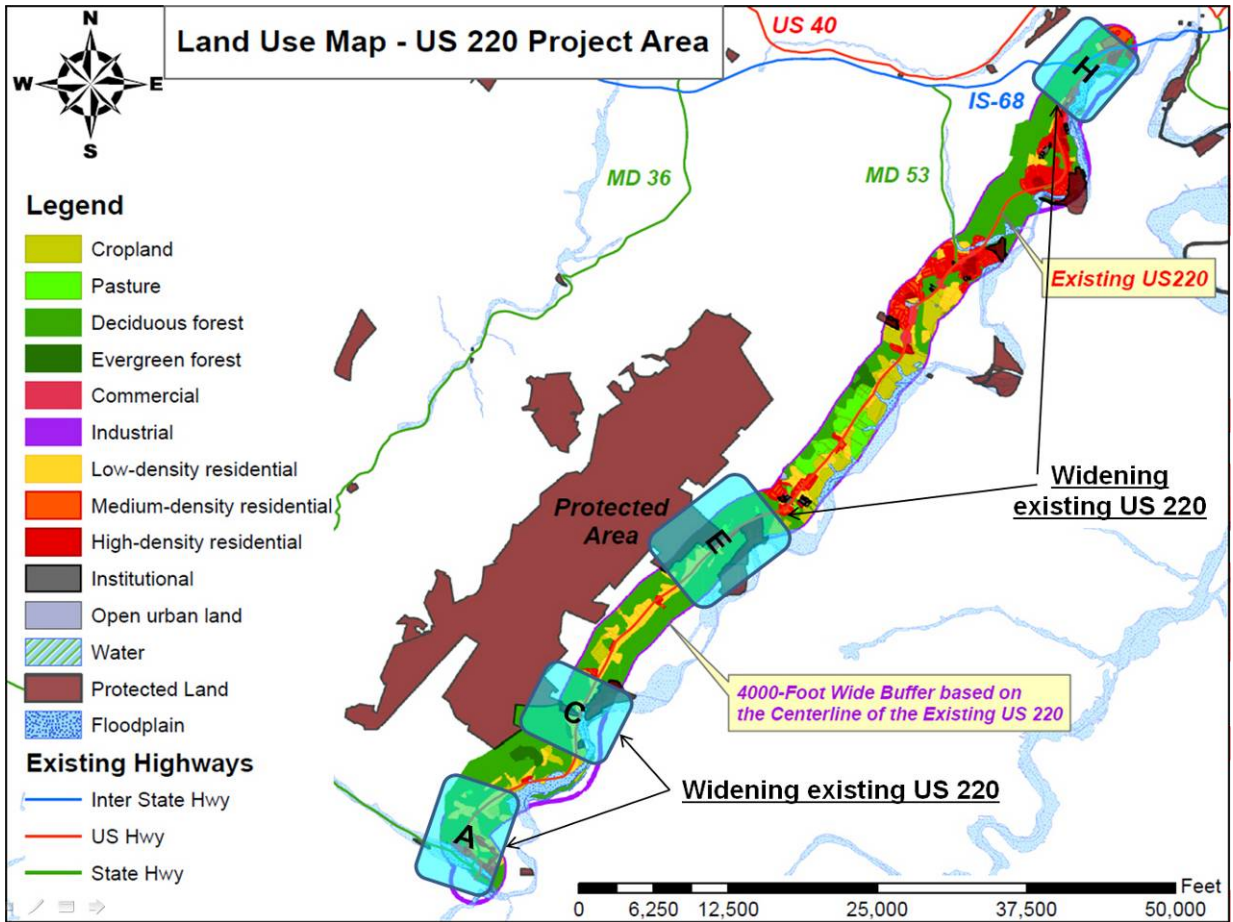


Figure 6: Sections where Widening of Existing US 220 is Preferred

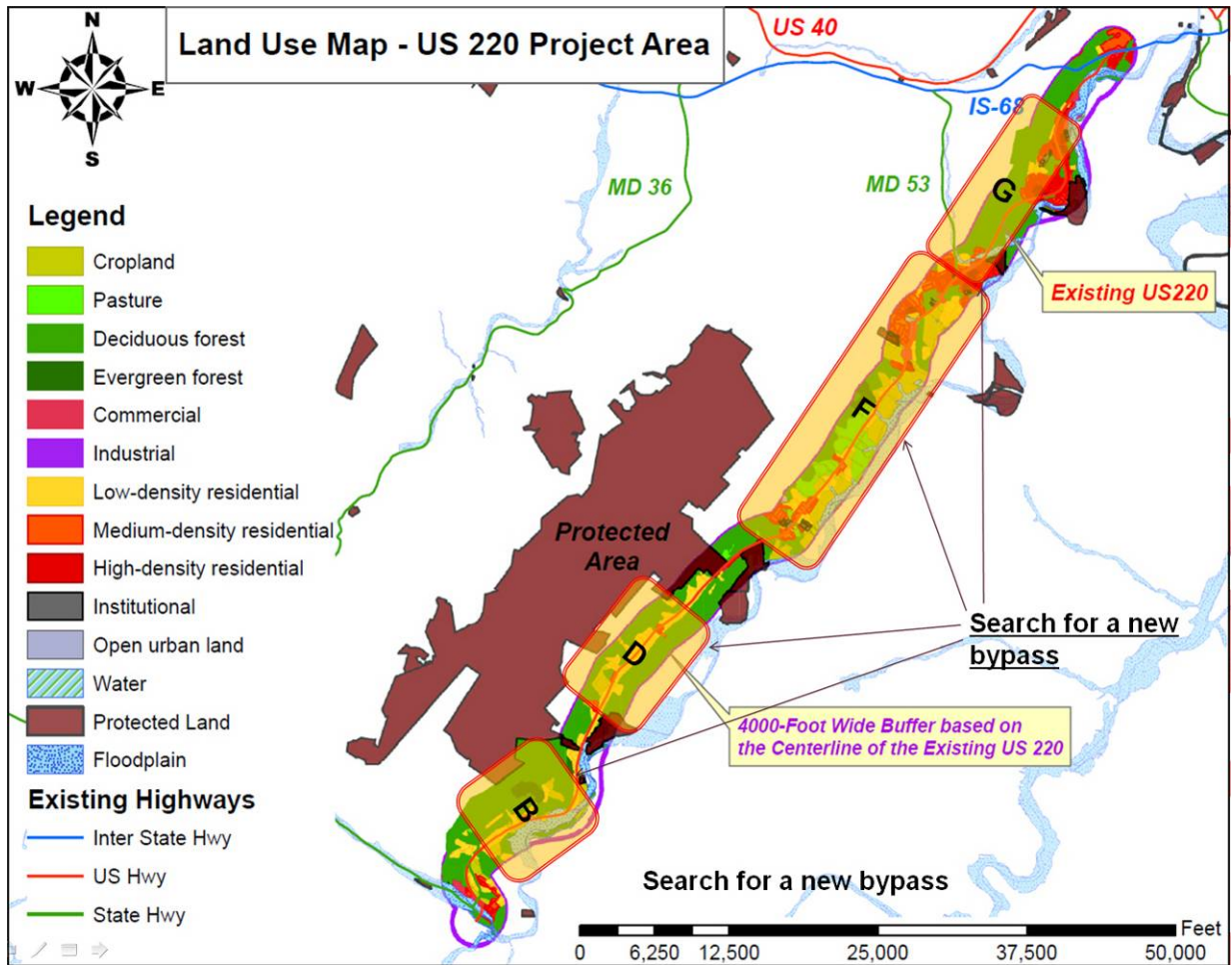


Figure 7: Locations where Development of a New Bypass is recommended

2.4 Design Characteristics:

The typical section for the new bypass on sections B, D, F and G is shown in Figure 8. It is called the *Normal Section* (named in the *US 220 Tier One study* by the West Virginia Division of Highways (DOH) and Maryland SHA, 2006), and its total width is 147 feet. It includes a wide grass median in the middle and two travel lanes and paved shoulders in each direction. Figure 9 shows the typical section for sections A, C, E, and H where widening of existing US 220 is recommended. This typical section is called *Alternate Section* (named in the *US 220 Tier One study*, 2006), and its total width is 111 feet. It has a concrete median in the middle and two travel lanes and paved shoulders in each direction.

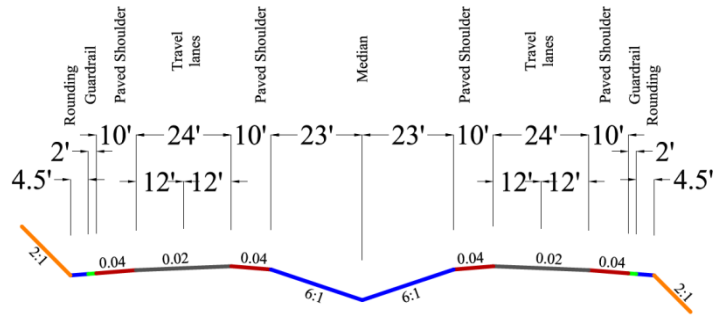


Figure 8: Typical Section for New Bypass in Segments B, D, F, and G

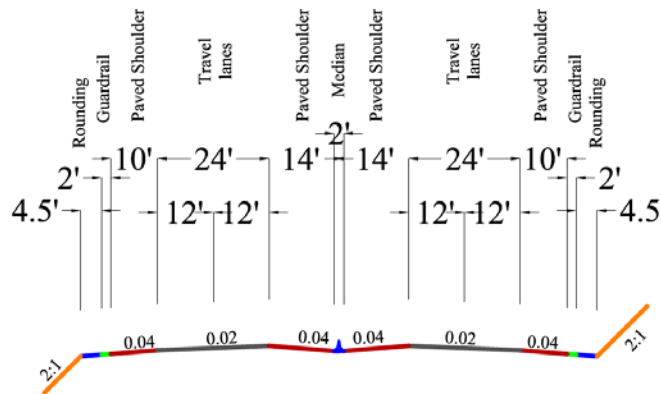


Figure 9: Typical Section for Widening of Existing US 220 in Segments A, C, E, and H

The geometric design specification of highway alignment alternatives for the new bypass was provided by SHA (Table 3), and it was used in sections B, D, F, and G.

Table 2: Design Characteristics

Design Parameters	Values
Design Speed	65 mph
Max. Superelevation rate	8%
Max. Grade	5%
Fill/Cut Slope	(2:1)
Min Radius (Horizontal curve)	1300ft
Spiral length (Horizontal curve)	400 ft
K value (vertical curve)	200

3. Highway Alignment Optimization (HAO) Model

The HAO model is an intelligent optimization tool developed to assist planners and designers in finding the preferable highway alignment alternatives (usually the most cost-effective paths) connecting specified endpoints or zones. It integrates genetic algorithms with a geographic information system (GIS) for optimizing highway alignments and processes massive amounts of relevant data associated with highway design and alternative evaluation. It has been extensively developed by Morgan State University and the University of Maryland since 1996, and has been previously applied to an actual highway construction project in Maryland (3D Highway Alignment Optimization for Brookeville Bypass, 2004).

3.1 Representation of Highway Alignments in the HAO Model

In the model, a horizontal alignment is defined by the tangents, circular curves, and the connecting transition curve sections. A vertical alignment is defined by the graded-tangents connected with parabolic curves. The configuration of these elements depends on the points of intersections (PI's); thus generating a highway alignment can be reduced to determining its corresponding series of PI's.

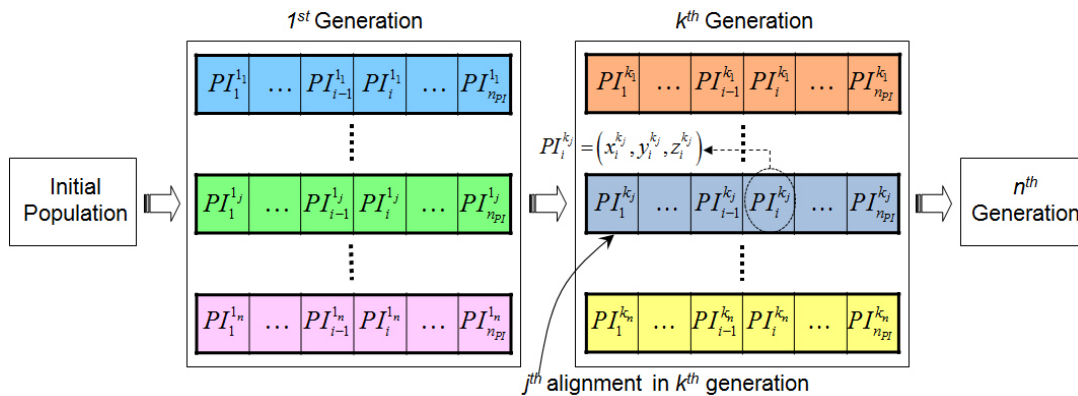


Figure 10: Representation of highway alignments in GA

To find best candidate highway alignments, the model employs genetic algorithms (GAs). In the model, the alignments are represented with chromosomes, and each chromosome has a series of genes defined by the xyz coordinates of PI's (see Figure 10). It is important to note that the genes are not independent of each other because if a coordinate of one PI is changed, the alignment configuration at other PI's may change. It should also be noted that the alignment optimization process is based on a pool-based search of the GA rather than single solution comparison, and thus a set of possible highway alignments (i.e., chromosomes) is treated as the population in the model. About forty to a hundred alignments are generated in each generation

depending on the complexity of the chromosome (i.e., the number of genes), and the individual alignments within each generation compete with each other to reproduce offspring based on their “fitness” (i.e., objective function value). After enough generations, the fittest individuals should survive, whereas poor solutions get discarded, and the population will finally converge to an optimized solution.

The stopping criterion of the GA optimization method is based on the improvement in the objective function values of the alignments reproduced. Thus, if there is no significant improvement in the objective function value during a certain number of generations, the alignment optimization process is terminated. Eight customized genetic operators (*uniform, straight, non-uniform, whole non-uniform mutations, simple, two-point, arithmetic, and heuristic crossovers*) have been developed for reproducing chromosomes. Jong and Schonfeld (2003) provide further details about these genetic operators.

3.2 Integration of GA and GIS

In the model, a genetic algorithm (GA) with a number of specialized genetic operators is used for optimizing highway alignments. In addition, a Geographic Information System (GIS) module is integrated with GA to evaluate the generated highway alignments realistically and comprehensively. The primary roles of the GA-based optimization and the GIS module embedded in the model are summarized in Table 4.

Table 4: Summary of Principal Processes in the HAO Model

Principal Process	Role of the Principal Process
GA-Based Optimization	<ul style="list-style-type: none"> ▪ Generating highway alignments ▪ Evaluating major alignment-sensitive costs ▪ Earth work cost/Length-dependent cost/Structure cost/Maintenance cost ▪ Travel time cost/Vehicle operation cost/Accident cost ▪ Searching optimized highway alignments based on the principles of natural evolution and survival of the fittest
GIS-Based Evaluation	<ul style="list-style-type: none"> ▪ Evaluating alignment’s right-of-way cost ▪ Evaluating alignment impacts on the study area <ul style="list-style-type: none"> - Environmental impact/Socio-economic impact

During the alignment search process, GA and GIS communicate by exchanging their inputs and outputs (see Figure 11). First, a set of new highway alignments (i.e., initial population) is generated by GA. Then, spatial information about the alignments is transmitted to GIS, and the alignments’ right-of-way cost, environmental impact, and socio-economic impact are evaluated in GIS, while the other alignment-sensitive costs (e.g., earthwork cost and maintenance cost) are evaluated in the GA module. After all costs and impacts of the alignments are estimated, they are

ranked based on their fitness values (i.e., objective function values). Next, the fittest individuals (i.e., alignments ranked with higher fitness values) survive to reproduce new population of the next generation, whereas the least-fit individuals are eliminated. These evolutionary steps (i.e., alignments generation, evaluation, ranking, and reproduction procedures) are repeated until a specified stop-criterion is satisfied.

Four types of inputs are needed for optimizing the highway alignments. (1) The design specifications, normally defined based on AASHTO design standards (2004), are needed for generating the highway alignments. (2) Unit costs (e.g., unit pavement cost and unit earthwork cost), defined by the model users, are needed for alignment evaluation. (3) The GIS inputs are essential for computing an alignment’s right-of-way cost as well as for evaluating its impacts on environmentally and socio-economically sensitive areas in the study region. The model users can also express their preferences by specifying their areas of interest and untouchable areas in the GIS layers. (4) Finally, information about current and future traffic on the new highway is also needed for user cost estimation.

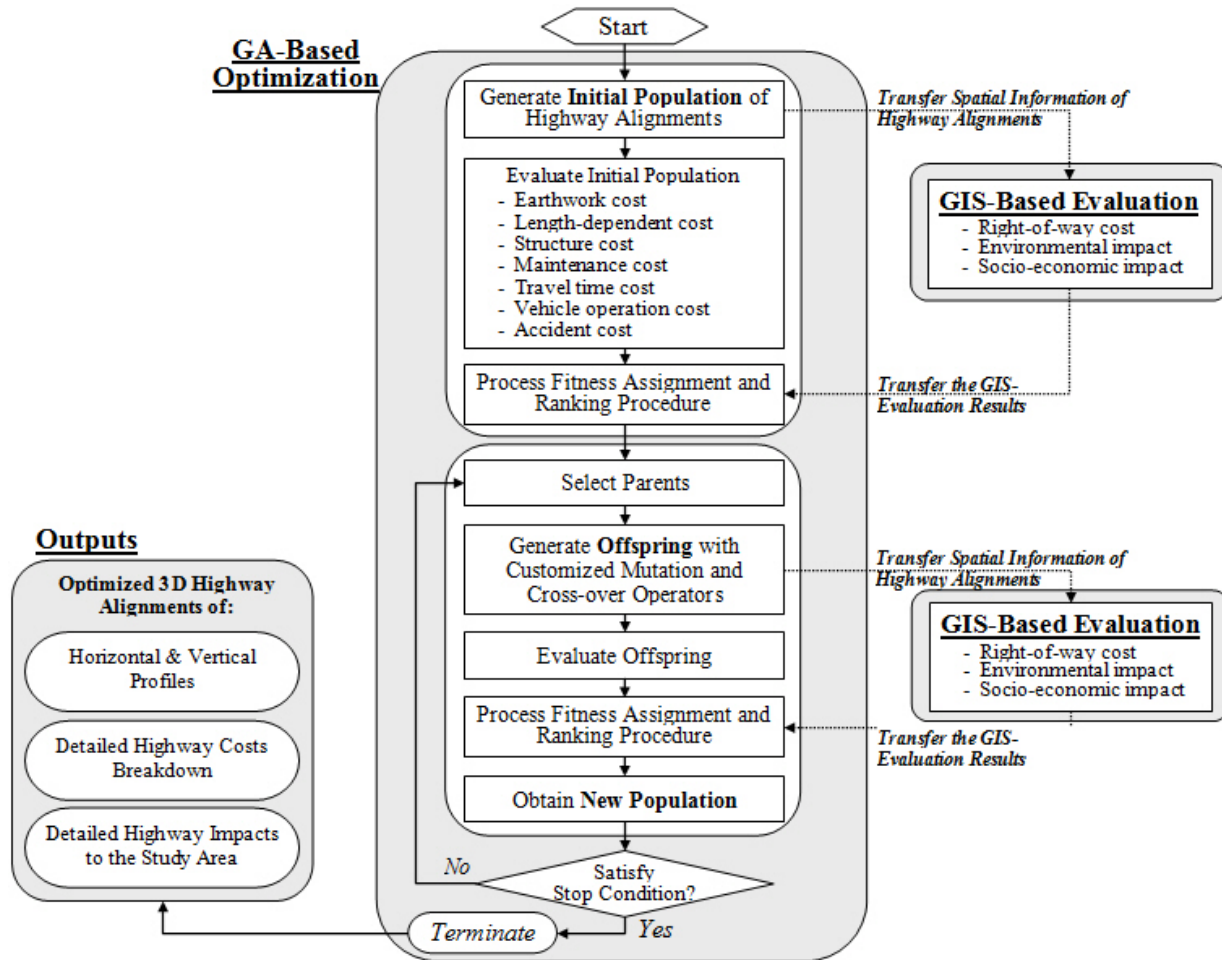


Figure 11: HAO Model Basic Structure

Various practical and quantitative results of the optimized alignments are provided as model outputs. The model output includes horizontal and vertical profiles of the optimized highway alignments, impacts on the study areas, and various alignment-sensitive costs. A graphical view of the optimized alignments is also provided on a GIS map as a model output.

3.3 HAO Model Evaluation Criteria for the US 220 Project:

For evaluating various alternative alignments of US 220, various highway costs were considered as decision criteria. In this model application, the objective function includes five major agency cost components (i.e., length-dependent, right-of-way, bridge, earthwork, and maintenance costs) with a penalty cost to deal with the impact of the new highway to the environmentally sensitive areas in the project limit. The model objective function was formulated based on total cost (C_{Total}) minimization, and its basic mathematical formulation is described below. Note that mathematical details for each cost function are not discussed here but presented in Appendix A.

$$C_{Total} = C_L + C_R + C_B + C_E + C_M + C_P$$

where

- C_L = length-dependent cost
The length-dependent cost is the cost proportional to alignment length. Initial highway pavement cost and costs required for construction of basic highway facilities for vehicle operation (such as barriers, guardrails and medians) may be included in this cost.
 C_L = unit length-dependent cost \times the length of the new highway
- C_R = right-of-way cost
The right-of-way cost (also known as land acquisition cost) can be estimated with unit land cost (\$/sq. ft.) and actual areas (i.e., areas within the right-of-way limit) of all properties required for the new highway development.
 $C_R = \Sigma$ (unit land cost \times area taken by the new highway)
Note: In addition to the land acquisition cost, reduction of property value due to the nearby highway as well as the usability of the remaining lands or site improvement cost due to the new highway development may be considered for more precise right-of-way cost estimation.
- C_E = earthwork cost
The earthwork cost can be estimated based on the amount of earthwork volume required for highway construction. Some unit costs related to the earthwork (such as unit cut and

fill costs) needed to estimate the cost. It is noted that the earthwork cost function is formulated based on the average-end-area method.

$C_R = \text{total haul cost} + \text{total cut cost} + \text{total fill cost}$

Note that in this model application to the US 220 project, the unit interval for the earthwork volume computation is set to 50 feet, and thus every 50 feet the earthwork volumes are estimated. Earth shrinkage and bulk factors used for estimating earthwork volume are set to 0.9 and 1.1, respectively.

- $C_B = \text{Bridge cost}$

Bridge structure is used for grade separation of the new highway with existing roads. A simple regression model with two parameters representing length and width of a bridge are used for estimating the bridge cost.

$C_B = \alpha \times (\text{bridge length} \times \text{bridge width}) + \beta$

- $C_M = \text{Maintenance cost}$

The highway maintenance cost occurs throughout the design life of the road. Therefore, for life-cycle cost estimates, it is generally discounted over the design life at an appropriate interest rate. The maintenance cost generally includes costs of routine highway maintenance, such as repair of roadway pavement, guardrail, and median and drainage. Road resurfacing and rehabilitation costs may also be included in the maintenance cost.

$C_M = C_{MH} + C_{MB}$

- C_{MH} : Maintenance cost for basic highway segment
- C_{MB} : Bridge maintenance cost

It should be noted that the assumed design life of the preferred highway in this project is 30 years and a 6% annual interest rate is used to estimate the present value of the highway maintenance cost.

- $C_P = \text{Penalty cost}$

Various types of environmentally sensitive areas (e.g., wetland and wild-life refuge) may be included in a highway construction area. Impacts to such areas should be as minimal as possible and if any, special care should be taken to replace and restore them. In the HAO model, GIS maps containing various geographic entities are provided as a model input, and the highway alignment under evaluation is overlaid on the GIS maps for estimating its impact to the study area. Thus, the fractions of affected land parcels needed for the alignment are computed. If the area of the land parcel affected by the highway alignment exceeds its pre-defined maximum allowable limit (defined as $MaxA$), the exceeded amount of area is counted as a penalty. A soft penalty function (shown in Appendix A) is included in the objective function to smoothly guide the search in the optimization process. The penalty function is also used where a generated alignment

violates the specified design constraint, for instance if the alignment is insufficient to accommodate minimum curve length (Kang et al, 2009).

Table 5 shows assumed unit costs and coefficients used in the cost functions for estimating the total agency costs of highway alternatives.

Table 5: Objective Function Components

Evaluation Criteria	Unit Cost
Length-dependent cost	Unit length-dependent cost = \$600/ft
Right-of-way cost	Unit land cost range: 0 – 6 \$/sq.ft.
Earthwork cost	Unit cut cost = \$35/cubic yard
	Unit fill cost = \$20/cubic yard
	\$2/cubic yard for (moving earth from a borrow pit)
	\$3/cubic yard for (moving earth to a landfill)
Bridge cost	$\alpha=91.3$, $\beta =688,51$
Maintenance cost	Unit maintenance cost for highway basic sections = \$1/ft/yr
	Unit maintenance cost for bridges (\$/yr) = 1% of the initial construction cost
	$i = 6\%$
	$N= 30$ years

4. HAO Model Application to US 220 Project

To optimize highway alternative alignments using the HAO model for a particular project, various model input parameters associated with roadway geometry and construction cost (such as the cross-section information, design standards, and unit construction cost) should be carefully determined, since they can significantly affect the optimization results.

4.1 Optimization Result

The model parameters used in the US 220 project are presented in previous sections 2.4 and 3.3. These parameters were determined with assistance from SHA's Office of Planning. The design life of the preferred highway was assumed to be 30 years and a 6% annual interest rate was used to estimate the present value of the highway maintenance cost. The alignment optimization process took into account five major agency cost components (i.e., length-dependent, right-of-way, earthwork, bridge, and maintenance costs) while automatically resolving trade-offs among them. Note that a penalty cost was employed in the model objective function to evaluate the impacts on the environmentally sensitive areas. User costs (e.g., travel time cost and vehicle operation costs) were not considered in this project.

As mentioned in a previous chapter, the US 220 project limit was divided into eight sections. For some sections (Case 1: sections A, C, E, and H as shown in Figure 6) widening of existing US 220 is preferred, and for others new bypasses are recommended (Case 2: sections B, D, F, and G shown in Figure 7). Thus, the HAO model was used to optimize alternative alignments of the US 220 in Case 2 sections, B, D, F, and G. The model searched over 300 generations, thereby generating and evaluating about 10,000 alternative alignments for each section. The model was applied to the Case 1 sections to estimate the construction cost of widening existing US 220. Note that 147 foot-wide *Normal Section* (shown in Figure 8) was used when developing new bypasses for Case 2 sections, while 111 foot-wide *Alternate Section* (shown in Figure 9) was used when widening the existing US 220 for Case 1 sections.

A desktop PC with Intel® Core™2 Duo and 2 GB RAM was used to run the model. It took about 12 hours to optimize the highway alignments for each of the Case 2 sections.

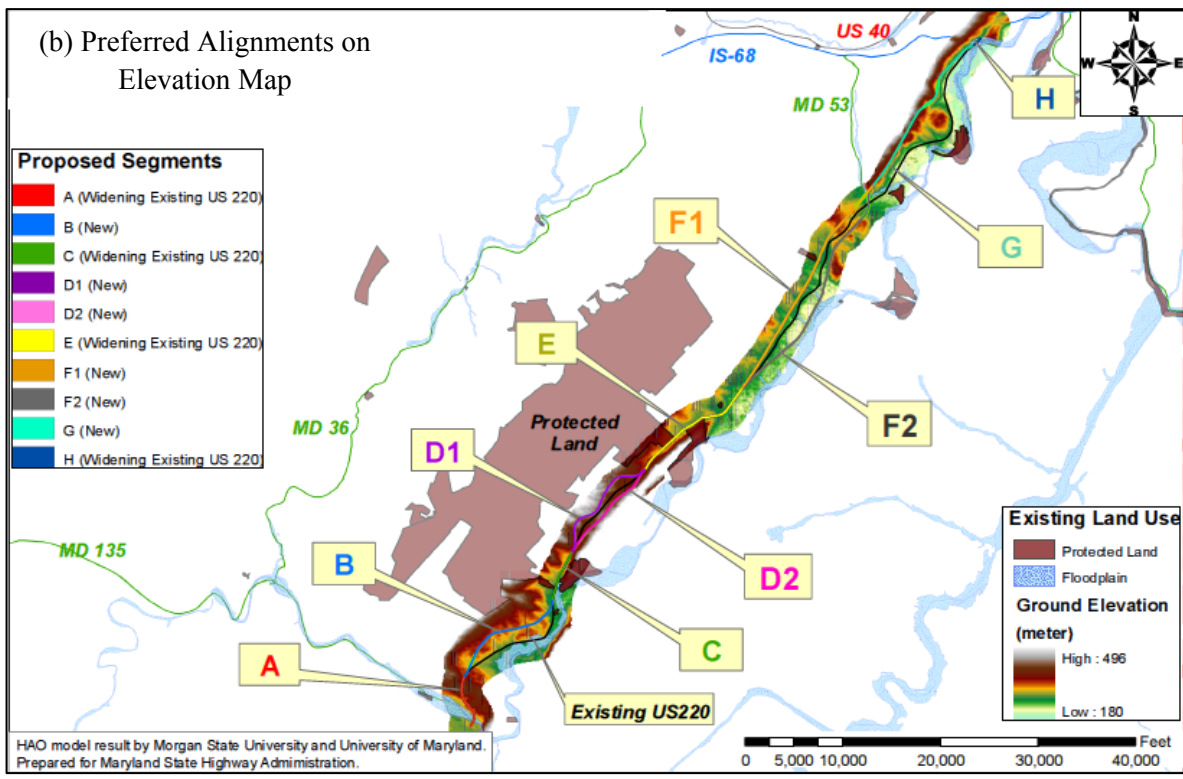
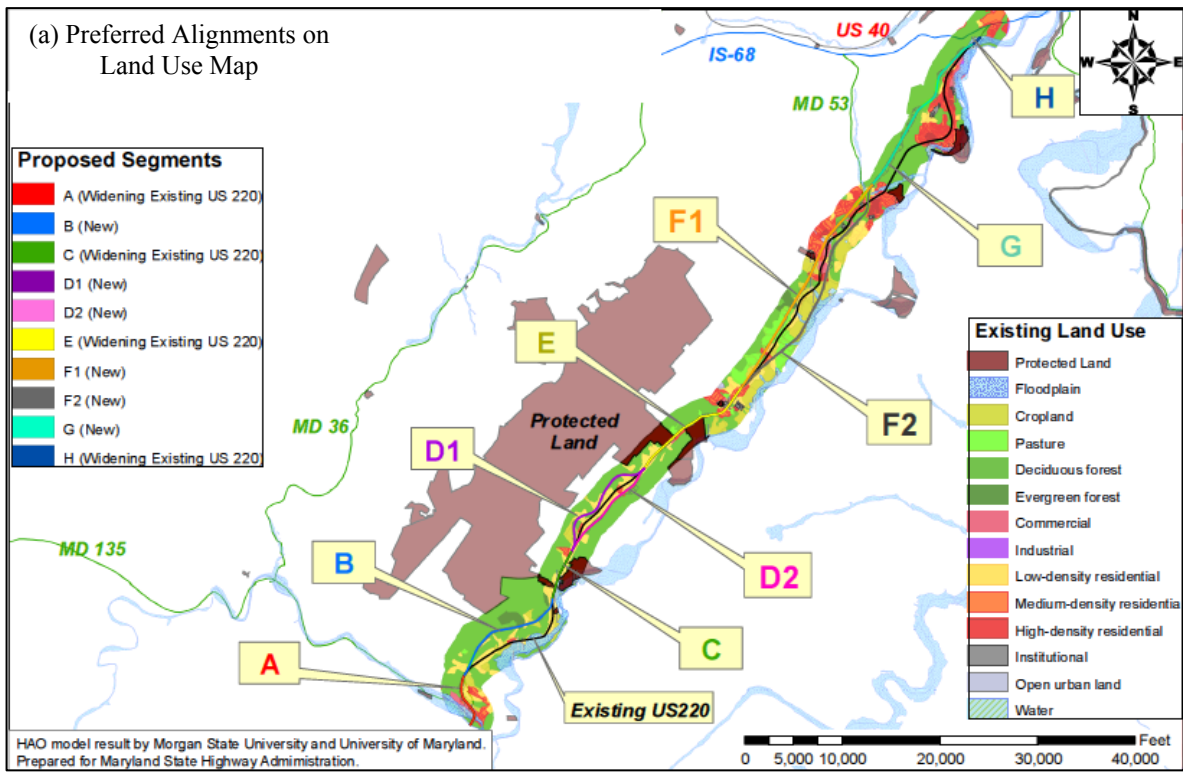


Figure 12: Preferred Alternative Alignments for Existing US 220

Figure 12 shows preferred horizontal alignments optimized by the HAO model for the Case 2 sections. As shown in the figure, the alternative alignments mostly take pasture and forest for their rights-of-ways, by avoiding environmentally sensitive areas (including the protected lands and state parks), high elevation regions, and high land cost areas. However, they unavoidably affect some residential and commercial areas (see Figure 12 and Table 6) due to the complexity of the land use within the search boundary (i.e., the 4,000 foot-wide buffer along existing US 220). The preferred alignments displayed on other types of maps (e.g., land cost and aerial maps) are presented in Appendix B.

Table 6: Area Taken by Preferred Road Segments by Land Use Type

Proposed segment	Right-of-way cost (\$)	Areas taken by the proposed road segment (sq.ft.) by land use type										
		Total	Residential	Commercial	Industrial	Institutional	Open-Land	Park	Forest	Cropland	Pasture	Water
A	335,932	1,507,523	258,027	390,916	0	0	0	0	478,494	368,753	0	0
B	97,434	2,886,191	591,750	0	0	0	0	0	2,090,673	203,768	0	0
C	83,305	755,199	702,423	0	0	0	0	0	52,776	0	0	0
D1	293,620	2,909,502	1,624,001	0	0	0	0	0	967,620	317,880	0	0
D2	538,286	3,148,933	1,269,814	0	0	0	0	0	1,879,118	0	0	0
E	3,348,906	2,326,653	1,207,123	34,167	0	0	0	0	999,506	0	3,381	0
F1	3,407,908	6,753,750	2,594,683	44,007	0	0	95,553	0	1,329,910	1,062,144	1,596,381	0
F2	2,913,545	6,888,416	2,483,897	237,953	0	0	0	0	1,395,884	2,199,625	571,058	0
G	557,495	6,994,617	280,846	631	2,112	0	0	0	6,704,016	0	0	0
H	3,866	344,789	0	0	0	0	0	0	344,472	0	0	0

Table 7: Basic Description of Preferred Road Segments

Proposed segment	Total Cost (million \$)	Length (feet)			New bypass vs. Widening of existing road	Typical Section
		Total	Basic segment	Bridge		
A	51.66	5,586	5,586	0	Widening of existing US 220	Alternate
B	49.53	13,017	11,855	1,162	New development	Normal
C	8.84	5,226	5,226	0	Widening of existing US 220	Alternate
D1	50.14	12,780	12,780	0	New development	Normal
D2	64.24	11,469	11,469	0	New development	Normal
E	54.39	13,333	13,333	0	Widening of existing US 220	Alternate
F1	187.66	24,886	22,886	2,000	New development	Normal
F2	178.86	25,619	22,919	2,700	New development	Normal
G	221.84	17,998	15,698	2,300	New development	Normal
H	8.63	1,117	1,117	0	Widening of existing US 220	Alternate

Table 7 shows the basic characteristics of preferred road segments in which their lengths and typical sections are presented. Note that two alternative alignments are considered for sections D and F (i.e., options D1 and D2 for section D; options F1 and F2 for section F), while the only one alternative was selected in the other sections. A total of four highway bridges were proposed for the entire project: one on Segments B, F1 and F2, and two on Segment G. Among them, the bridge on Segment F2 is for the grade separation of the existing US 220, while the others are chosen because bridge construction is more economical there than earthwork.

Table 8 shows the total cost breakdown for each preferred segment, which is based on the trade-off among the six cost components included in the objective function. It shows that the earthwork, bridge, and length-dependent costs dominate other agency costs. The earthwork cost accounts for a significant fraction (about 70 – 80%) of the total cost of all the preferred road segments. The bridge structure also accounts for a large fraction of the total cost; however, the fraction of the right-of-way cost is not significant, because the US 220 project area is located in a mountainous region where property values are relatively low. None of the preferred alignments take any environmentally sensitive areas, and thus no penalty cost is applied. Other costs such as user cost, contingency cost and utility relocation cost are not considered in this case study. More details about each preferred road segment are discussed in the next section. Note that the earthwork volume details for each preferred segment are presented in Appendix C.

Table 8: Total Cost Breakdown of Preferred Road Segments

Proposed segment	Total cost breakdown (million \$)							Length (feet)		
	Total	Right-of-way	Earthwork cost	Length-dependent	Maintenance	Bridge	Penalty	Total	Basic segment	Bridge
A	51.66	0.34	47.89	3.35	0.08	0.00	0.00	5,586	5,586	0
B	49.53	0.10	29.54	7.81	1.62	10.47	0.00	13,017	11,855	1,162
C	8.84	0.08	5.54	3.14	0.07	0.00	0.00	5,226	5,226	0
D1	50.14	0.29	42.01	7.67	0.18	0.00	0.00	12,780	12,780	0
D2	64.24	0.54	56.67	6.88	0.16	0.00	0.00	11,469	11,469	0
E	54.39	3.35	42.86	8.00	0.19	0.00	0.00	13,333	13,333	0
F1	187.66	3.41	148.54	14.93	2.82	17.96	0.00	24,886	22,886	2,000
F2	178.86	2.91	132.66	15.37	3.69	24.23	0.00	25,619	22,919	2,700
G	221.84	0.49	186.81	10.80	3.09	20.65	0.00	17,998	15,698	2,300
H	8.63	0.00	7.94	0.67	0.02	0.00	0.00	1,117	1,117	0

4.2 Preferred Road Segments

Segment A

Segment A is a widening section of existing US 220, and thus it is assumed that Segment A shares not only the horizontal baseline but also the vertical profile of the existing US 220 for this section. Segment A starts from the West Virginia State line at McCoole, Maryland (see Figure 13) and passes through commercial and medium density residential areas (between stations 0+00 and 35+00). It enters the area of croplands and deciduous forests from station 35+00 to 56+00, and is then connected with Segment B. The unit cost of properties within the Section A is relatively low (it ranges from 0 to \$2/sq.ft). However, the elevation in this section varies significantly; it ranges between the lowest point of 780 feet and the highest point of 1,033 feet. Thus, a significantly high earthwork cost was estimated for Segment A (about 93% of its total cost), as shown in Table 8.

It is important to note that the elevation (DEM from MdProperty View) used for representing the as-built plan of existing US 220 for this section is not precise enough to estimate detailed earthwork quantity due to its low resolution. As shown in Figure 14 (a), the estimated existing elevation of Section A (i.e., the vertical profile of the existing US 220) is very hilly, and thus the earthwork cost was huge. It should be noted that the earthwork cost of Segment A would be significantly reduced if more precise elevation data are provided.

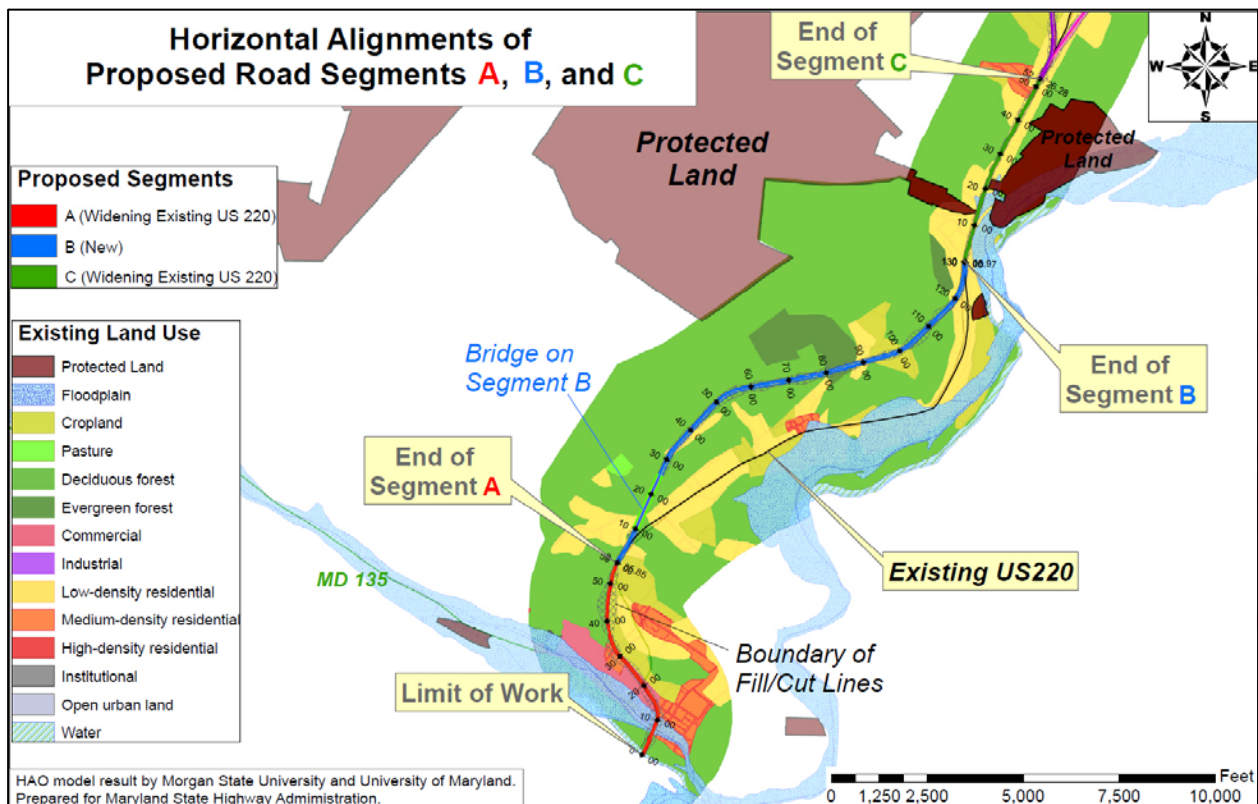


Figure 13: Horizontal Alignments of Preferred Road Segments A, B, and C.

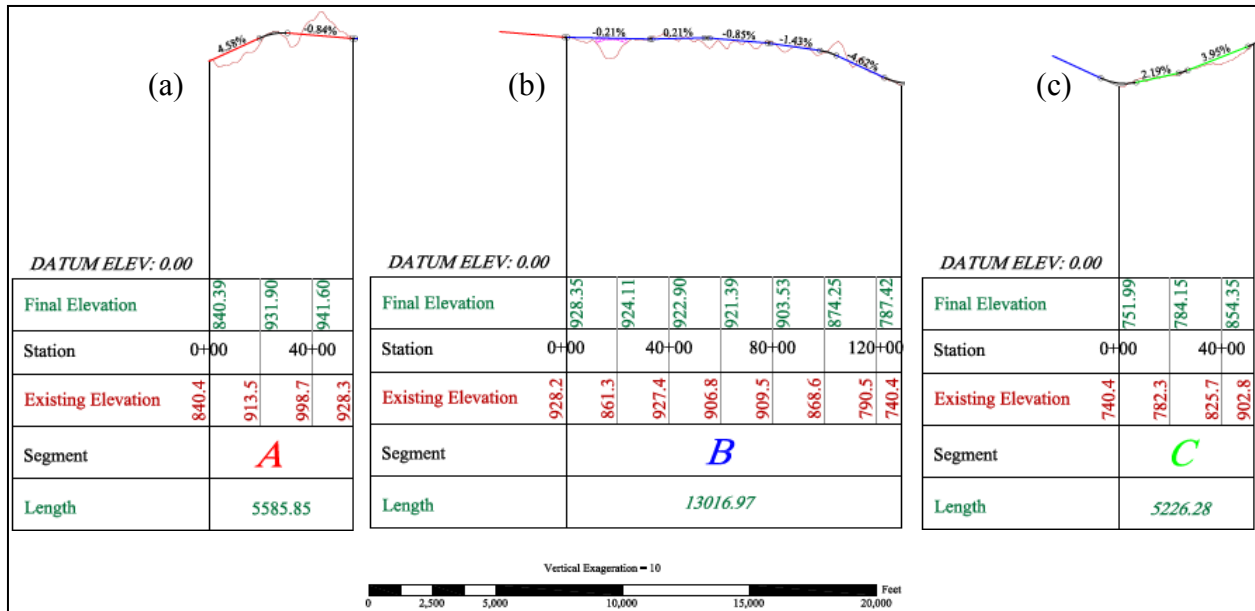


Figure 14: Vertical Alignments of Preferred Road Segments A, B, and C.

Segment B

Segment B is a new bypass section of US 220. Its alignment is optimized by the HAO model, and total length is 13,017 feet. It diverges from US 220 at the end of Segment A and merges again with it road at the beginning of Segment C (see Figure 13). Note that Section B is mostly covered by forest and croplands. Property values in this section are very low; the highest property value is 1.2 \$/sq. ft., but most are below \$0.5/sq.ft. Some low density residential areas are located along existing US 220 and there is a wide and long floodplain on the right side of the road. Segment B runs through the north-west side of the US 220, by avoiding the residential areas and floodplains.

The vertical profile of Segment B is presented in Figure 14 (b). It shows that there is a large valley near the start point of Segment B (between station 11+75 and 23+37) where a highway bridge is proposed. It is estimated that the bridge construction is less costly than fills in this section. Other parts of Segment B are close to ground elevation, and thus earthwork cut and fill can be balanced. Total earthwork estimated for Segment B is 334k cubic yard of fills. Earthwork volume details of Segment B can be found in Appendix C.

Segment C

As shown in Figure 13, Section C is located in a mountainous area and is surrounded by environmentally protected lands. Widening the existing roadway is recommended in this section instead of a new bypass. The total length of Segment C is 5,226 feet. The *Selinger Marsh*

Preservation area is located on its right side, extended from station 10+00 to 52+00. On its left side, a part of the *Dan's Mountain Wildlife Maintenance* area limits its right-of-way. A floodplain is also very close on the right side of the road. Thus, Segment C should run through a narrow gate bounded by the protected lands and floodplain.

The vertical profile of Segment C (shown in Figure 14 (c)) is close to the ground elevation, balancing earthwork cut and fill volumes. The estimated total earthwork volume for Segment C is about 154k cubic yards (see Appendix C), which is estimated to cost \$5.54 million. In addition, the length-dependent cost, which may include pavement, barriers and guardrails construction costs, dominates other costs in Segment C.

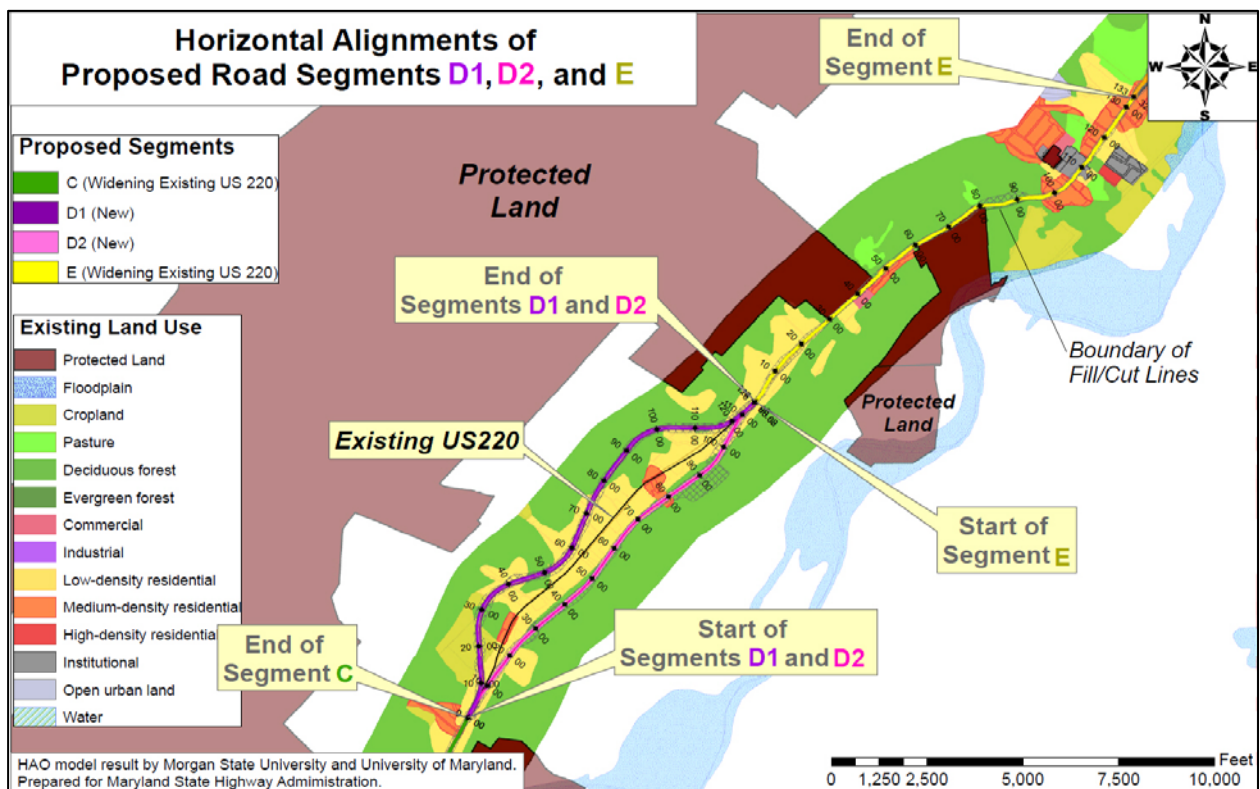


Figure 15: Horizontal Alignments of Preferred Road Segments D1, D2, and E.

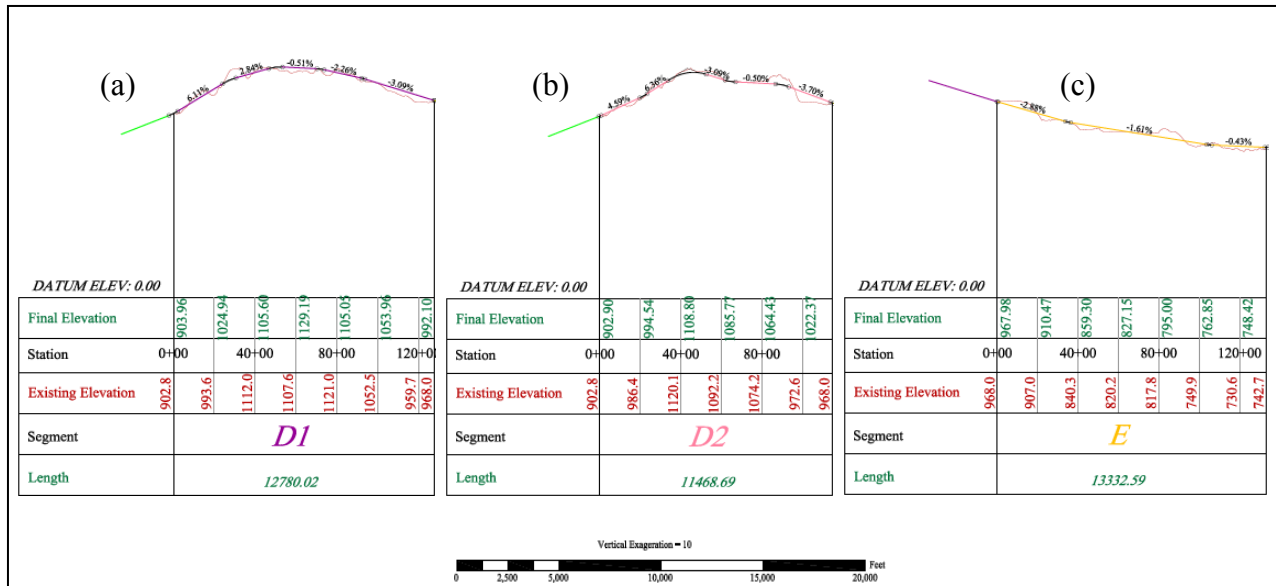


Figure 16: Vertical Alignments of Preferred Road Segments D1, D2, and E.

Segments D1 and D2

Section D is the highest part of the project area. The topography of this section is mountainous with elevation ranging from 300 to 496 meters. The right-of-way of existing US 220 runs through the low elevation part in Section D (see Figure 12 (b)), and low density residential areas are located along the US 220 (see Figure 15). Two optimized alignments, called Segments D1 and D2, are selected in Section D as alternatives of a new bypass. These alternatives were obtained through two separate alignment optimization processes of the HAO model. Segment D1 runs on the left side of the existing US 220, while Segment D2 is located on its right side. In terms of the roadway geometry and alignment length, Segment D2 seems better than Segment D1 because the former (D2: 11,469 feet) is shorter and relatively straighter (horizontally) than the latter (D1: 12,780 feet). However, Segment D1 is better than Segment D2 in terms of total construction cost; it is estimated that the construction cost of Segment D1 is about 78 % of Segment D2 construction cost (see Table 8). Both alternatives have a smooth crest vertical curve on their vertical alignments (see Figures 16(a) and (b)). Note that the widening of the existing US 220 can be another alternative in this section.

Segment E

As in Section C, the right-of-way of US 220 is also very limited in Section E due to the land use complexity and environmental constraints. There are two huge protected lands in this section: one is on the left side of US 220 (*Dan's Mountain Wildlife Maintenance area*) and the other is on

the right side of the road (an exempt area owned by *State Road Commissions* and *Nature Conservancy* in Maryland). There is another small protected land (a jurisdictional public work properties owned by *Allegany County Commissioners*) in the upper part of Section E (see Figures 5(b) and 15). Thus, widening of existing US 220 is strongly recommended in this section. Segment E is selected in this section for improving the existing US 220. It does not affect any protected lands and its total length is 13,333 feet. A relatively high right-of-way cost (compared to the others) is needed for Segment E since some fraction of high density residential, commercial and institutional properties might be taken for expanding the cross section of the existing road. No bridge is included in Segment E and its vertical alignment is on the down grade from the beginning (see Figure 16 (c)). Segments F1 and F2 diverge from Segment E when it passes by a complex land use area at its north.

Segments F1 and F2

Section F is the largest of all the sections included in the project area. It is about 2,200 acres, and the land use of this section (especially its north portion) is very complex (see Figure 17). Not only pasture, croplands, and forest, but also residential and commercial areas exist in this section. Furthermore, floodplains and environmentally protected lands increase the land use complexity.

The HAO model was applied in this section to find the best alternative and as a result, two optimized alignments (named Segments F1 and F2) were selected as alternative bypasses for the US 220. Segment F1 goes on the left side of existing US 220, while Segment F2 is on its right side. Both alternatives have a bridge. The bridge on Segment F1 is proposed (by the model) because bridge construction is more economical there than earthwork fill, while the bridge on Segment F2 is proposed for the grade separation of existing US 220. Vertical profiles of the two alternatives are shown in Figure 18. Both the alternatives lie on relatively jagged terrain which includes a valley between stations 220+00 and 240+00.

Segment F1 is slightly shorter than Segment F2; however, the former one affects the high cost lands (i.e., residential and commercial properties) more than the latter one as shown in Figure 17. Segment F2 is less expensive to build than F1 (see Table 8).

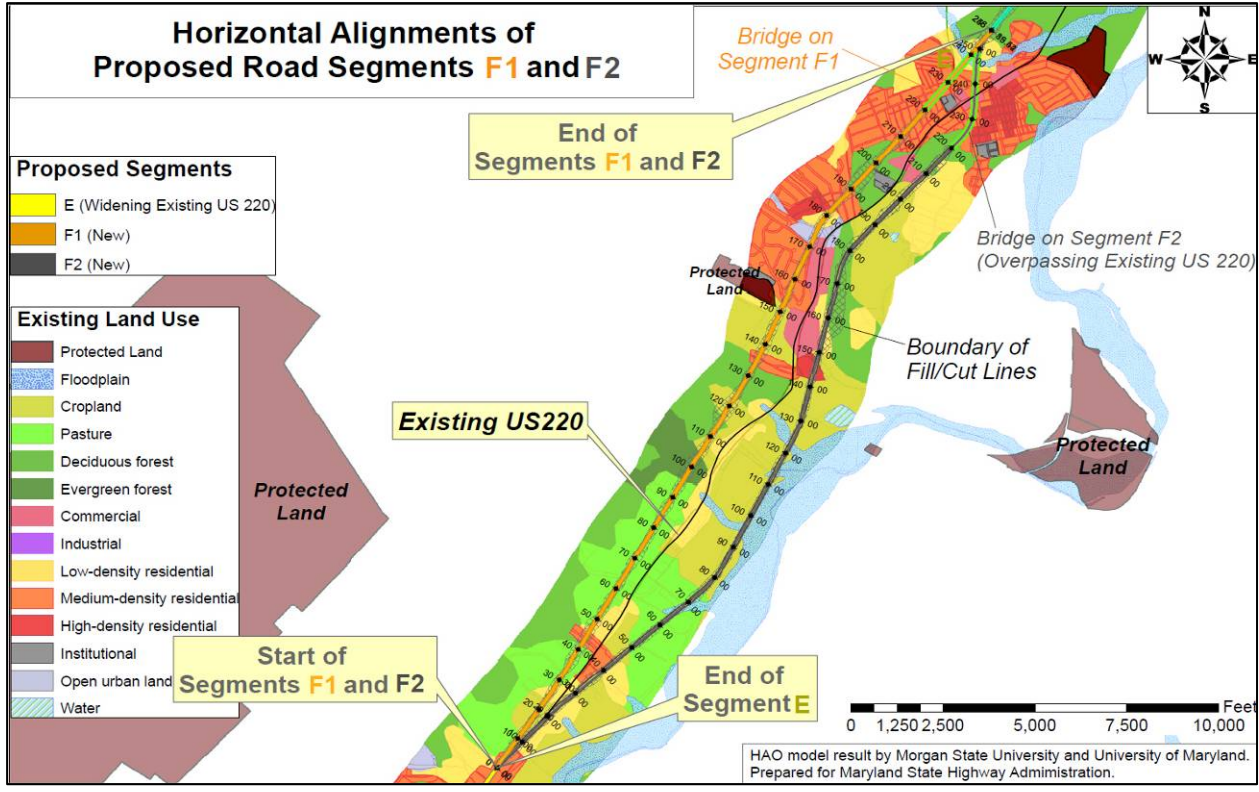


Figure 17: Horizontal Alignments of Preferred Road Segments F1 and F2.

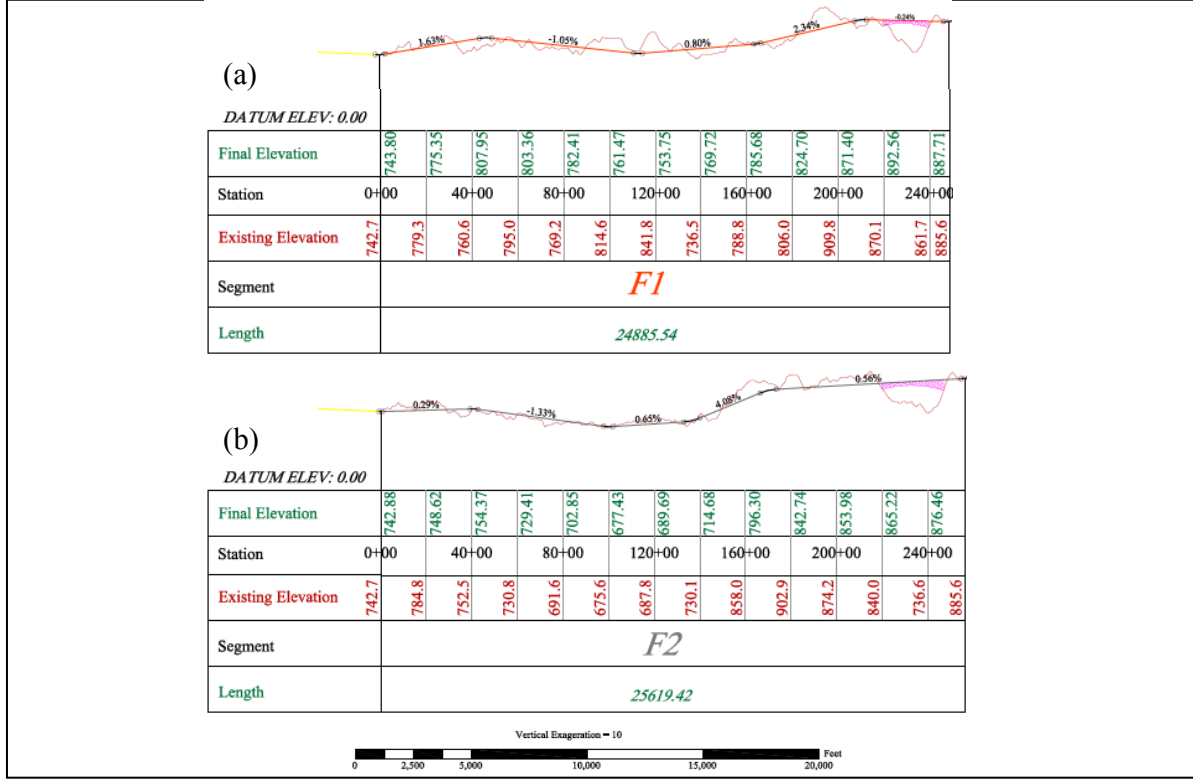


Figure 18: Vertical Alignments of Preferred Road Segments F1 and F2.

Segment G

Segment G, as optimized by the HAO model, is an alternative bypass of existing US 220 in Section G. Its total length is 15,698 feet. It merges with Segment H at its north end and meets with Segment F1 or F2 at its south end (see Figure 19). Segment G mostly takes forest for its right-of-way, and avoids complex land use and protected lands which are on the left side of the existing US 220. Thus, its estimated right-of-way cost is very low despite the big area of the land taken by the road. However, the estimated earthwork cost of Segment G is the highest among all the preferred road segments since it runs on mountainous terrain with high elevation changes (see Figure 20 (a) for the vertical alignment of Segment G). Two highway bridges are proposed in Segment G. The first bridge is between stations 95+00 and 106+00, and the second one is between stations 116+00 and 129+00. Note that these bridges are proposed by the HAO model since they are less costly than fills.

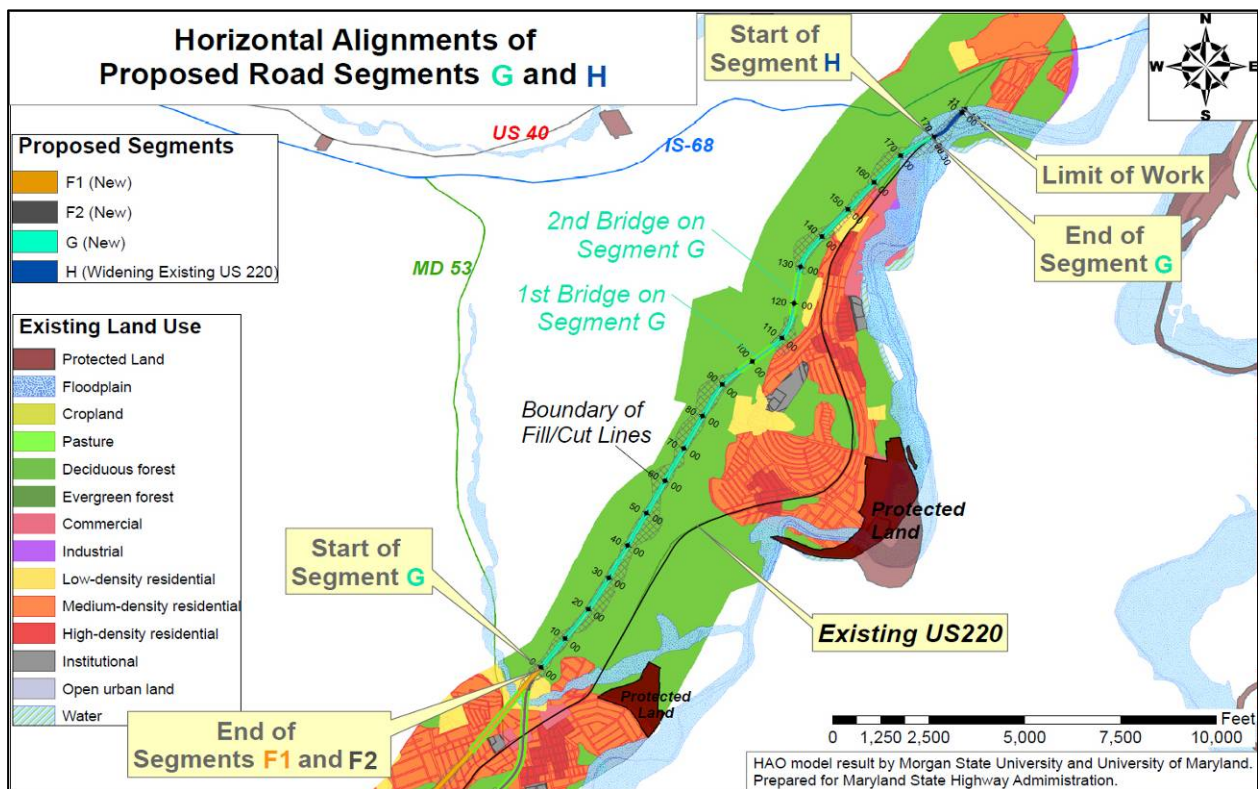


Figure 19: Horizontal Alignments of Preferred Road Segments G and H.

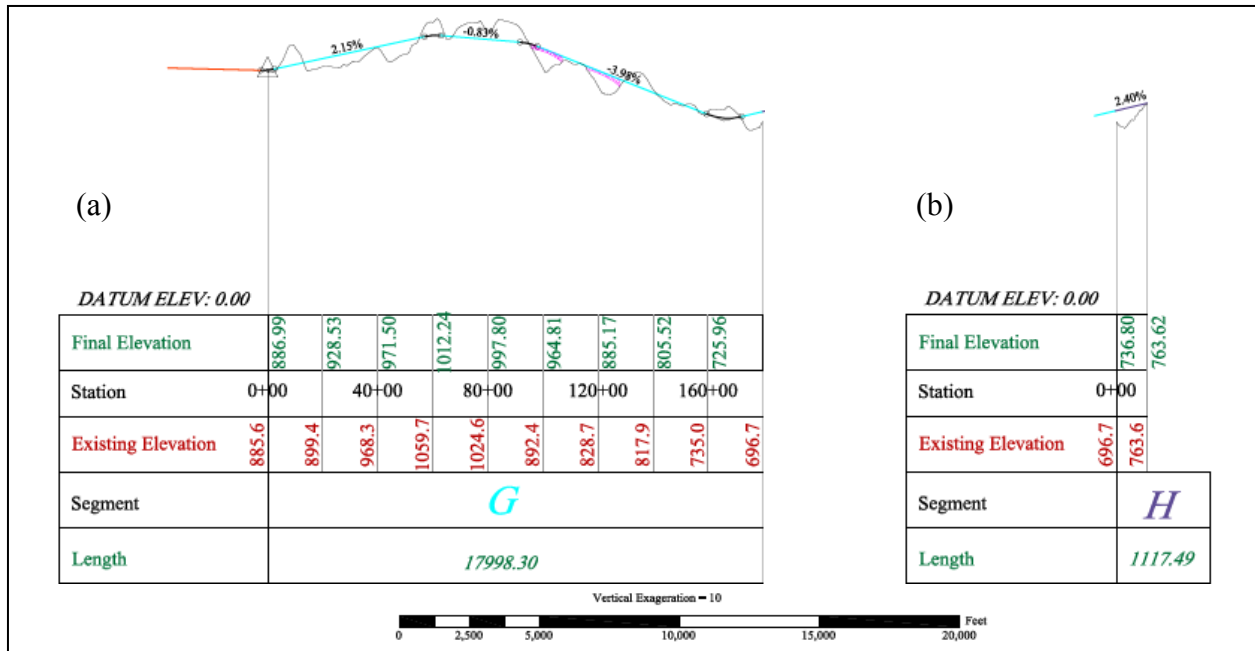


Figure 20: Vertical Alignments of Preferred Road Segments G and H.

Segment H

Section H is the last section with the project limit in which widening of the existing US 220 is proposed. Segment H connects with Segment G at its south end and its cross section becomes 111 feet wide from that point. Most of its right-of-way is on floodplains as shown in Figure 19, and it is the shortest (1,117 feet) among all the preferred road segments. It is important to note that the earthwork cost of Segment H is somewhat overestimated due to the low resolution of elevation data used. As in Segment A, the estimated existing ground elevation of Segment H (i.e., the vertical profile of existing US 220 at Section H shown in Figure 20 (b)) is not precise enough to estimate detailed earthwork quantity. Thus, the use of higher resolution elevation data is highly recommended for better earthwork cost estimation.

4.3 Alternatives (Combination of Preferred Road Segments)

The final alternatives of existing US 220 were obtained through the combination of all the road segments selected in each section of the entire project limit. Four alternative alignments are available for comparison as follows:

- Alt1: ABCD1EF1GH
- Alt2: ABCD1EF2GH
- Alt3: ABCD2EF1GH
- Alt4: ABCD2EF2GH

Table 9 shows the total cost breakdown of the four alternatives. It shows that Alt2 (combination of Segments A, B, C, D1, E, F2, G and H) is the least costly alternative at about \$624 million in estimated total cost. Its total length is 94,676 feet (17.93 miles) and includes four highway bridges: one in each of Segment B and F2, and two in Segment G.

Table 9: Cost Breakdown Comparison for Alternatives

Proposed Alignments	Total cost breakdown (million \$)							Length (feet)		
	Total	Right-of-way	Earth-work	Length-dependent	Maintenance	Bridge	Penalty	Total	Basic segment	Bridge
Alt1: ABCD1EF1GH	632.68	8.06	511.12	56.37	8.06	49.08	0.00	93,943	88,481	5,462
Alt2: ABCD1EF2GH	623.89	7.56	495.25	56.81	8.93	55.34	0.00	94,676	88,514	6,162
Alt3: ABCD2EF1GH	646.78	8.30	525.78	55.58	8.04	49.08	0.00	92,632	87,170	5,462
Alt4: ABCD2EF2GH	637.99	7.81	509.91	56.02	8.91	55.34	0.00	93,365	87,203	6,162

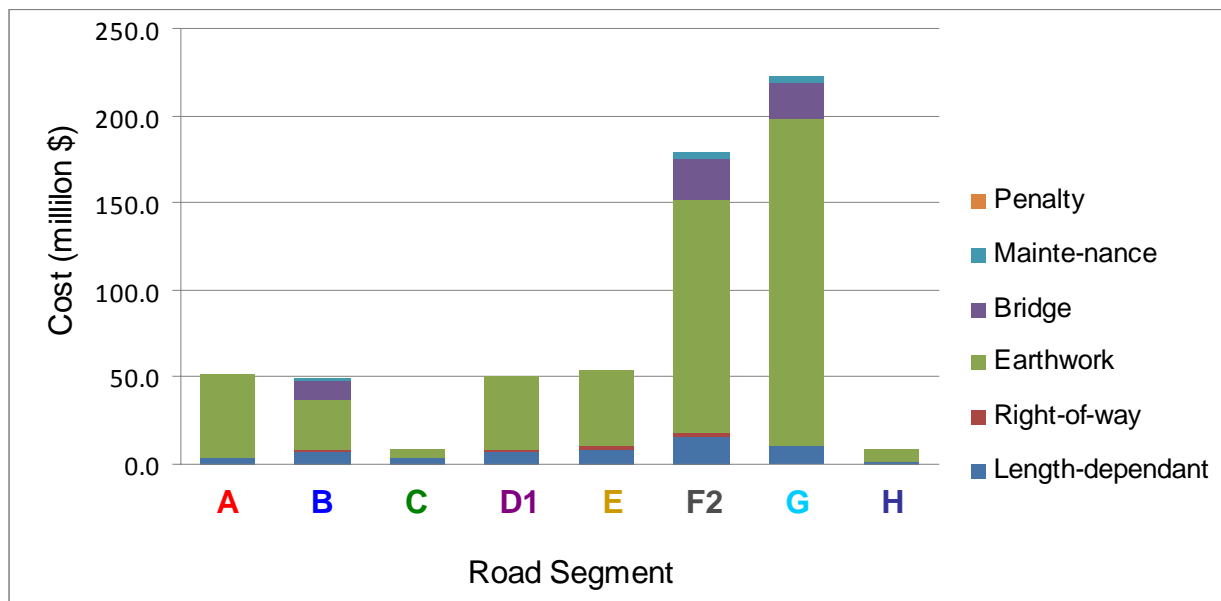


Figure 21: Segment Cost Breakdown for Alt2 (ABCD1EF2GH)

Figure 21 shows the total cost breakdown for Alt2. It shows that the earthwork cost accounts for a significant fraction (about 80%) of the total cost. The bridge structure also accounts for a large fraction of the total cost; however, the fraction of the right-of-way cost is relatively small, because the US 220 project area is mountainous and property values in it are relatively low. Other costs such as user cost, contingency cost and utility relocation cost are not considered in this case study. Among the eight road segments, Segments B, F2, and G account for more than 72% of the total cost, and cover about 60% of the entire section of Alt2. Earthwork, bridges, and length-dependent costs are the three major agency costs for these segments; however, the maintenance cost also constitutes a substantial fraction. The details of horizontal and vertical alignments of Alt2 are presented in Appendix B.

4.4 Sensitivity Analysis

The sensitivity of optimized alignments to design speed has been analyzed using the HAO model to see how the geometry of the preferred alignments and their construction costs are affected by design speeds. For this purpose, the HAO model was applied again to all the sections recommended for new bypasses of the existing US 220 (i.e., Case 2 sections) with a 55mph design speed. All the input parameter values were remained at their default values employed in previous analyses, and only the design speed was reduced from 65 mph to 55 mph. Note that the sensitivity analysis to design speed was not applied to the sections for widening of existing US 220 (i.e., Case 1 sections) since geometry of those sections are not subject to change.

Table 10 shows the differences in earthwork costs for the road segments found with 65 mph and 55 mph design speed. It shows that the earthwork cost is reduced for most of the road segments except for Segment D1 when design speed is reduced to 55mph. Significant reduction in earthwork cost is found, particularly for Segments D2 and G.

Table 11 shows the total earthwork cost of the four alternatives combined with eight road segments found with different design speeds. The result shows that Alt4 is the least cost alternative for a 55 mph design, while Alt2 is the least cost option at 65 mph design speed. It is estimated that the earthwork cost of Alt4 is significantly reduced (a \$72.65 million reduction) if design speed is changed from 65 mph to 55 mph.

Table 10: Segment Earth work Sensitivity to Design Speed for segments

Proposed Segment	Earthwork Cost (million \$)		Cost Reduction (million \$)
	65 mph	55 mph	
A	47.89	—	—
B	29.54	26.6	2.89
C	5.54	—	—
D1	42.01	54.5	-12.51
D2	56.67	26.0	30.69
E	42.86	—	—
F1	148.54	143.9	4.62
F2	132.66	127.2	5.42
G	186.81	153.2	33.65
H	7.94	—	—

Table 11: Earthwork Sensitivity to Design Speed for alternatives

Proposed Alternative Alignments	Earthwork cost (million\$)	
	65mph	55mph
Alt1: ABCD1EF1GH	511.12	439.27
Alt2: ABCD1EF2GH	495.25	465.80
Alt3: ABCD2EF1GH	525.78	453.93
ABCD2EF2GH	509.91	437.26

5. Conclusion

An optimized alignment, named Alt2, was selected in this project as the best alternative for the existing Maryland section of US 220. The total length of the preferred alternative is 94,676 feet (17.93 miles), and includes (1) 69,415 feet long new bypass section with 147 feet wide *Normal* cross section and (2) 25,262 feet long widening sections of existing US220 with 111 feet wide *Alternative* cross section. The total estimated cost for this alternative is about \$624 million, in which the largest fraction (about 80%) is the earthwork cost. The bridge structure also accounts for a large fraction of the total cost; however, the fraction of the right-of-way cost is relatively small, because the US 220 project area is mountainous and property values in it are relatively low. Other costs such as user cost, contingency cost and utility relocation cost are not considered in this case study, and thus the total cost may be underestimated.

The HAO model was applied in this project to search various alternative alignments of the US 220 Maryland section within a 4,000 foot-wide project limit. The final alternative was selected based on the five major agency costs (i.e., length-dependent, right-of-way, earthwork, bridge, and maintenance costs) which the alignment optimization process takes into account while automatically resolving trade-offs among them.

It is important to note that the validity and reliability of the model results (i.e., total cost estimation and the location of final alternative) vary depending on the accuracy of the input data used in the model application. The data source for estimating the earthwork volume and cost is the 30x30 meter resolution DEM file from MdProperty View. Since these elevation data are not precise enough to represent as-built plan of existing US 220, it is possible that the earthwork cost was considerably overestimated.

Reference

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2. Jha, M.K. and Schonfeld, P. (2000) Geographic Information System-Based Analysis of Right-of-Way Cost for Highway Optimization. *Journal of Transportation Research Board, Transportation Research Record: 1719*. pp. 241-249.
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4. Kang, M.-W., Jha, M.K., Schonfeld, P. (2006), 3D Highway Alignment Optimization for Brookeville Bypass. In *Proceedings of TRB Annual Meeting*, Washington, DC, Paper 06-1023 on CD-ROM.
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6. Kang, M.-W., Schonfeld, P., Jong, J.-C. (2007), Highway Alignment Optimization through Feasible Gates. *Journal of Advanced Transportation*, Vol. 41, No. 2, pp. 115-144.
7. Kang, M.-W., Schonfeld, P., and Yang, N. (2009) Prescreening and Repairing in a Genetic Algorithm for Highway Alignment Optimization. *Computer-Aided Civil and Infrastructure Engineering*, Vol. 24, No. 2, pp. 109-119.
8. West Virginia Division of Highways and Maryland State Highway Administration (2006), *U.S. Route 220 Tier One Environmental Impact Statement*

Appendix A: Highway Cost Functions

Length-dependent Cost (C_L)

$$C_L = u_P L_N w_P + u_L L_N \quad (\text{A.1})$$

$$w_P \leq w_N \quad (\text{A.2a})$$

$$w_N = w_L + w_S \quad (\text{A.2b})$$

Right-of-way Cost (C_R)

$$C_R = \sum_{k=1}^{n_{PC}} u_{v_k} \times A_k \quad (\text{A.3})$$

Note that Eq. (A.3) is the land-acquisition cost required for the right-of-way of the new highway. Reduction of property value due to a nearby highway as well as the usability of the remaining lands or site improvements cost due to the new highway construction may be also added for more precise right-of-way cost estimation (see Jha and Schonfeld, 2000).

Earthwork Cost (C_E)

$$C_E = C_H + \frac{1}{2} \sum_{i=1}^{n_E} \left[\omega_0 u_{c_i} s_r A_{c_i} L_{E_i} + \omega_1 u_{f_i} A_{f_i} L_{E_i} + \omega_2 (u_{c_i} s_r A_{c_i} + u_{f_i} A_{f_i}) L_{E_i} \right] \quad (\text{A.4})$$

$$\omega_0, \omega_1, \omega_2 = 0 \text{ or } 1; \quad \omega_0 + \omega_1 + \omega_2 = 1 \quad (\text{A.5a})$$

$$\omega_0 = 1 \text{ for a cut section, } \omega_1 = 1 \text{ for a fill section, and } \omega_2 = 1 \text{ for a transition section} \quad (\text{A.5b})$$

Note that Eq. (A.4) is formulated based on the average end area method, and C_H is the cost of moving earth between adjacent cut and fill sections to balance overall earthwork volume. For more detailed discussion of Eq. (A.4), see Jha (2000) and Jha and Schonfeld (2003).

Bridge Cost (C_B)

$$C_B = \alpha_0 + \alpha_1 \times l_B w_B \quad (\text{A.6})$$

$$l_B = \begin{cases} \left[\frac{w_E + 2h_m / s_f}{\cos(\theta_{CP} - \pi/2)} \right] + \left[w_{B^N} \tan\left(\theta_{CP} - \frac{\pi}{2}\right) \right] & \text{if overpassing an existing road} \\ \left[\frac{w_N + 2h_m / s_c}{\cos(\theta_{CP} - \pi/2)} \right] + \left[w_{B^E} \tan\left(\theta_{CP} - \frac{\pi}{2}\right) \right] & \text{if under-passing an existing road} \end{cases} \quad (\text{A.7})$$

Maintenance Cost (C_M)

$$C_M = C_{M^H} + C_{M^B} \quad (\text{A.8})$$

$$C_{M^H} = \left(L_N - \sum_{i=1}^{n_B} l_{B_i} \right) \left(u_{M^H} \sum_{k=1}^{n_y} \left(\frac{1}{(1+\rho)} \right)^k \right) \quad (\text{A.9})$$

$$C_{M^B} = \sum_{i=1}^{n_B} \left[u_{M^B} l_{B_i} \sum_{k=1}^{n_y} \left(\frac{1}{(1+\rho)} \right)^k \right] \quad (\text{A.10})$$

Penalty Cost (C_P)

$$C_P = C_{PE} + C_{PD^H} + C_{PD^V} \quad (\text{A.11})$$

$$C_{PE} = \sum_{k=1}^{n_{PC}} \left[\left(\beta_{E^0} + \beta_{E^1} \times (A_k - \text{Max}A_k)^{\beta_{E^2}} \right) \times I_{PE_k} \right] \quad \text{only if } A_k > \text{Max}A_k \quad (\text{A.12})$$

$$C_{PD^H} = \sum_{i=1}^{n_{HC}} \left[C_{PD^{HR}} + C_{PD^{HS}} + C_{PD^{ST}} \right] \quad \text{only if } R_{H_i} < R_{H_m}, S_{H_i} < S_{H_m}, \text{ or } S_{T_i} < S_{T_m} \quad (\text{A.13})$$

$$= \sum_{i=1}^{n_{HC}} \left[\left(\beta_{HR^0} + \beta_{HR^1} \times (R_{H_i} - R_{H_m})^{\beta_{HR^2}} \right) + \left(\beta_{HS^0} + \beta_{HS^1} \times (S_{H_i} - S_{H_m})^{\beta_{HS^2}} \right) + \left(\beta_{ST^0} + \beta_{ST^1} \times (S_{T_i} - S_{T_m})^{\beta_{ST^2}} \right) \right]$$

$$C_{PD^V} = \sum_{i=1}^{n_{VC}} \left[C_{PD^{VL}} + C_{PD^{VS}} + C_{PD^{VG}} \right] \quad \text{only if } L_{V_i} < L_{V_m}, S_{V_i} < S_{V_m}, |g_i| > g_{\max} \quad (\text{A.14})$$

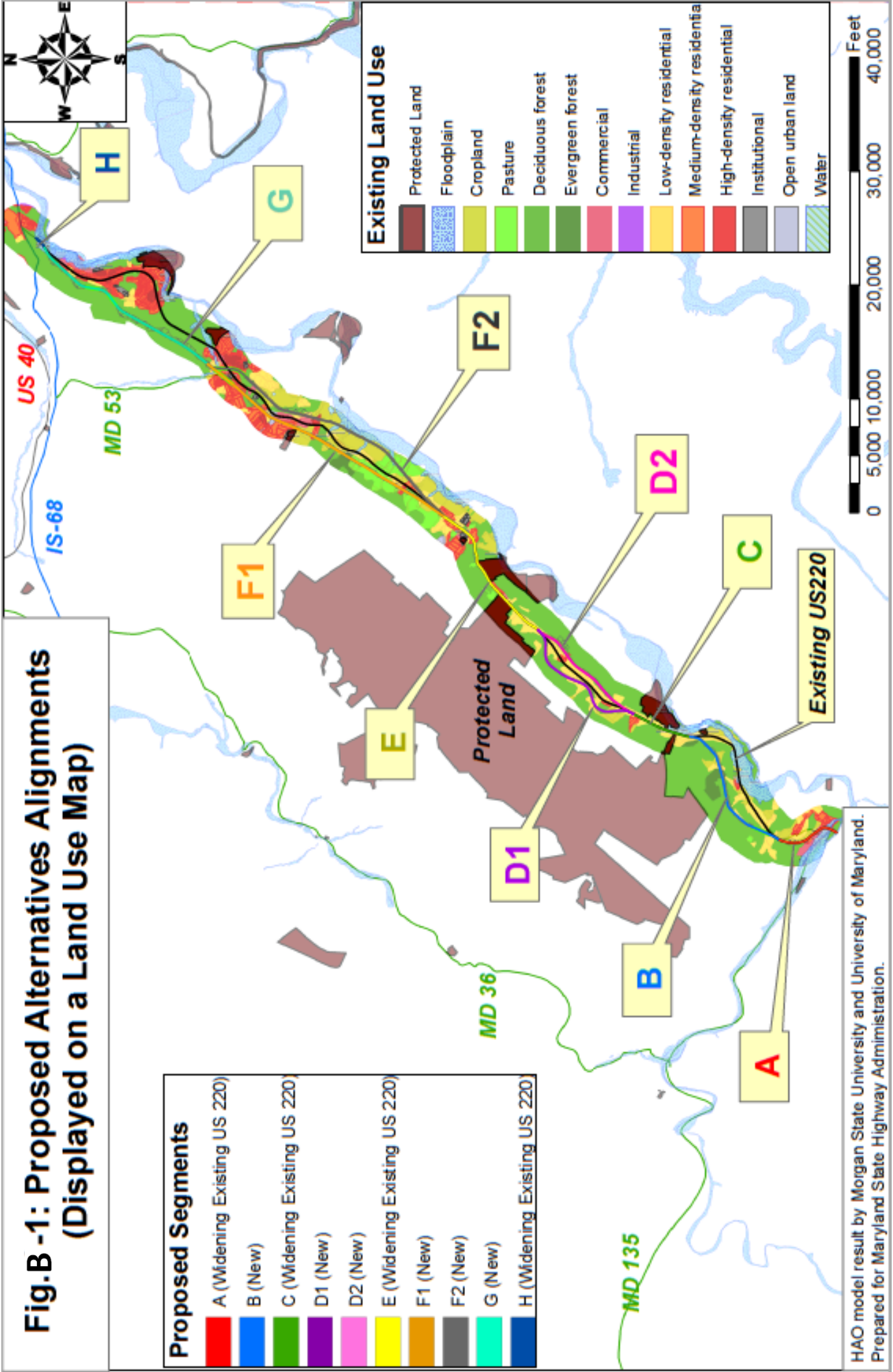
$$= \sum_{i=1}^{n_{VC}} \left[\left(\beta_{VL^0} + \beta_{VL^1} \times (L_{V_i} - L_{V_m})^{\beta_{VL^2}} \right) + \left(\beta_{VS^0} + \beta_{VS^1} \times (S_{V_i} - S_{V_m})^{\beta_{VS^2}} \right) + \left(\beta_{VG^0} + \beta_{VG^1} \times (g_i - g_{\max})^{\beta_{VG^2}} \right) \right]$$

Notation List

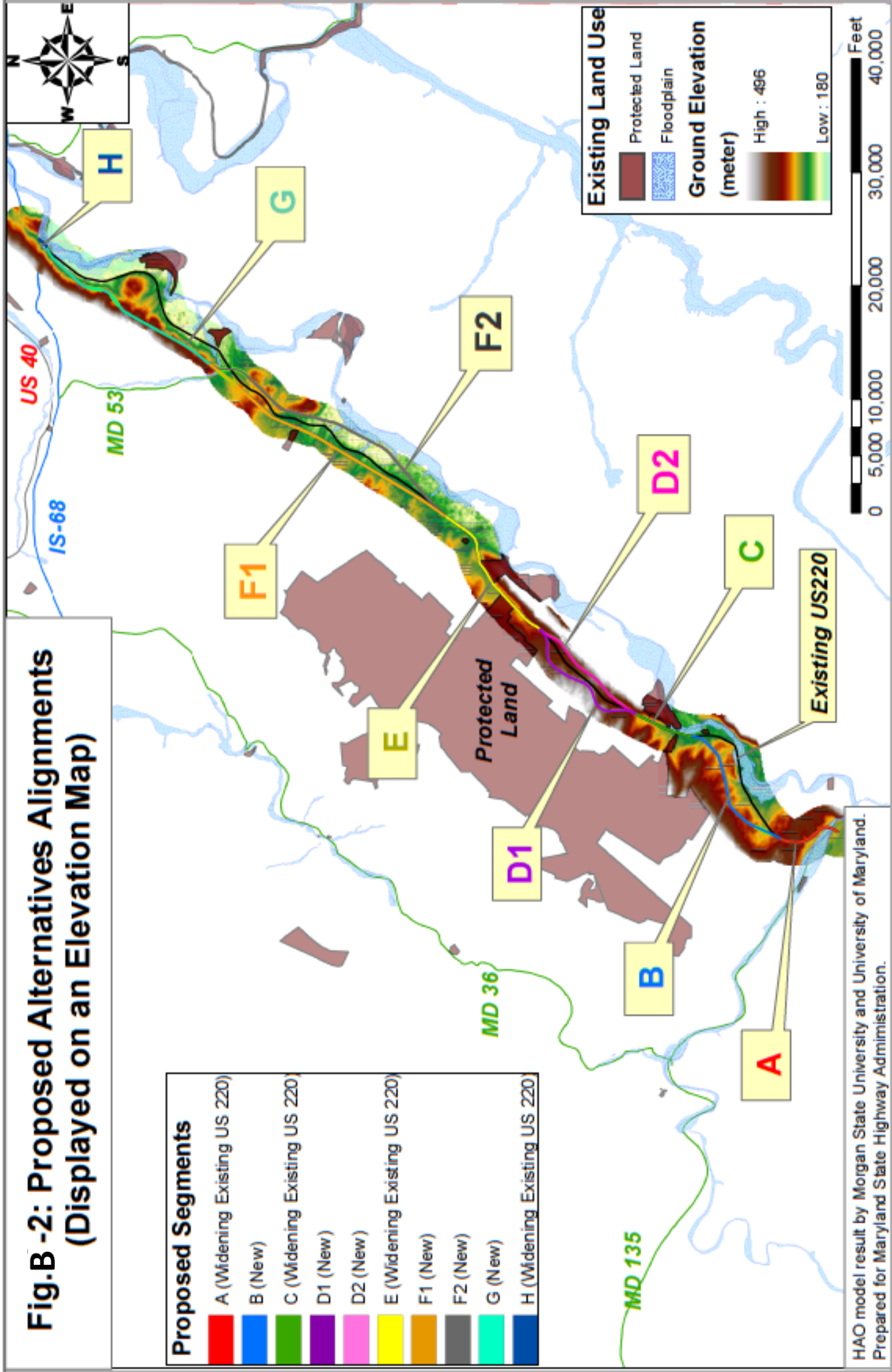
Notation	Description
α_0, α_1	Coefficients used in bridge cost computation
$\beta_{E^0}, \beta_{E^1}, \beta_{E^2}$	Coefficients used in computing C_{PE}
$\beta_{HR^0}, \beta_{HR^1}, \beta_{HR^2}$	Coefficients used in computing $C_{PD^{HR}}$
$\beta_{HS^0}, \beta_{HS^1}, \beta_{HS^2}$	Coefficients used in computing $C_{PD^{HS}}$
$\beta_{ST^0}, \beta_{ST^1}, \beta_{ST^2}$	Coefficients used in computing $C_{PD^{ST}}$
$\beta_{VG^0}, \beta_{VG^1}, \beta_{VG^2}$	Coefficients used in computing $C_{PD^{VG}}$
$\beta_{VL^0}, \beta_{VL^1}, \beta_{VL^2}$	Coefficients used in computing $C_{PD^{VL}}$
$\beta_{VS^0}, \beta_{VS^1}, \beta_{VS^2}$	Coefficients used in computing $C_{PD^{VS}}$
$\omega_0, \omega_1, \omega_2$	Binary integers used in earthwork cost computation;
A_c, A_f, A_{tc}, A_{if}	Cross-sectional areas under cut, fill, transitional cut, and transitional fill conditions
A_k	Affected area of the k^{th} land parcel by the highway alignment generated
A_T	Total area of a land parcel affected by the highway alignment
C_B	Bridge construction cost
C_E	Earthwork cost of the highway alignment
C_H	Total haul cost
C_L	Length-dependent cost of the highway alignment
C_M	Present value of total maintenance cost of the highway alignment
C_{MH}	Present value of the maintenance cost for highway basic segments
C_{MB}	Present value of bridge maintenance cost
C_P	Total penalty cost
C_{PE}	Penalty associated with environmentally sensitive areas taken by the new highway
C_{PD^H}	Penalty cost for violating design constraints of horizontal alignments
C_{PD^V}	Penalty cost for violating design constraints of vertical alignments
$C_{PD^{HR}}$	Penalty cost for violating the minimum horizontal curve radius
$C_{PD^{HS}}$	Penalty cost for violating the minimum horizontal sight distance
$C_{PD^{ST}}$	Penalty cost for violating the minimum length of spiral transition curve
Notation	Description

C_{PD}^{VL}	Penalty cost for violating the minimum length of vertical curve
C_{PD}^{VS}	Penalty cost for violating the minimum vertical sight distance
C_{PD}^{VG}	Penalty cost for violating the maximum allowable gradient
C_R	Right-of-way cost of the highway alignment
C_{Total}	Total construction cost (objective function value) of the highway alignment
g_i	Forward or back tangent grade at the i^{th} vertical curve section
g_{max}	Maximum allowable gradient
h_m	Minimum vertical clearance
I_{PE_k}	A dummy variable indicating if the k^{th} parcel is the environmentally sensitive area
L_N	Total length of the highway alignment generated
L_E	Length of a highway section for earthwork volume calculation
L_{V_i}	Vertical curve length at the i^{th} vertical curve section
L_{V_m}	Minimum length of vertical curve
l_{B_i}	Length of the i^{th} highway bridge
$MaxA_k$	Maximum allowable area of the k^{th} land parcel for the new highway construction
n_B	Total number of bridges in the highway alignment generated
n_E	Total number of highway sections for earthwork volume calculation
n_{HC}	Total number of horizontal curve sections of the highway alignment generated
n_{PC}	Total number of land parcels affected by the highway alignment generated
n_{PI}	Total number of PI's that outlines the highway alignment generated
n_{VC}	Total number of vertical curve sections in the highway alignment generated
R_{H_m}	Minimum horizontal curve radius
R_{H_i}	Horizontal curve radius at the i^{th} horizontal curve section
s_c, s_f	Cut and fill slopes, respectively
S_{H_i}	Horizontal sight distance at the i^{th} horizontal curve section
S_{H_m}	Minimum horizontal sight distance
s_f	Earth shrinkage or swell factor
S_{T_i}	Spiral transition curve length at the i^{th} horizontal curve section
S_{T_m}	Minimum length of spiral transition curve
S_{V_i}	Vertical sight distance at the i^{th} vertical curve section
S_{V_m}	Minimum vertical sight distance
u_c	Unit cut cost
u_f	Unit fill cost
u_L	Unit length-dependent cost except pavement cost
u_{MB}	Unit bridge maintenance cost
u_{MH}	Unit maintenance cost for highway basic segments
u_P	Unit pavement cost
u_{v_k}	Unit cost (property value) of the k^{th} land parcel affected by the highway alignment
w_B	Bridge width; $w_B = w_L$ for the new highway
w_E	Width of an existing road intersected by the new highway
w_L	Travel lanes width of the new highway
w_N	Width of the new highway; $w_N = w_L + w_S$
w_P	Width of paved portion of the new highway; $w_P \leq w_N$
w_S	Shoulders width of the new highway

Appendix B: Horizontal and Vertical Alignments of Alternatives



**Fig.B -2: Proposed Alternatives Alignments
(Displayed on an Elevation Map)**



Proposed Segments	
■	A (Widening Existing US 220)
■	B (New)
■	C (Widening Existing US 220)
■	D1 (New)
■	D2 (New)
■	E (Widening Existing US 220)
■	F1 (New)
■	F2 (New)
■	G (New)
■	H (Widening Existing US 220)

Existing Land Use

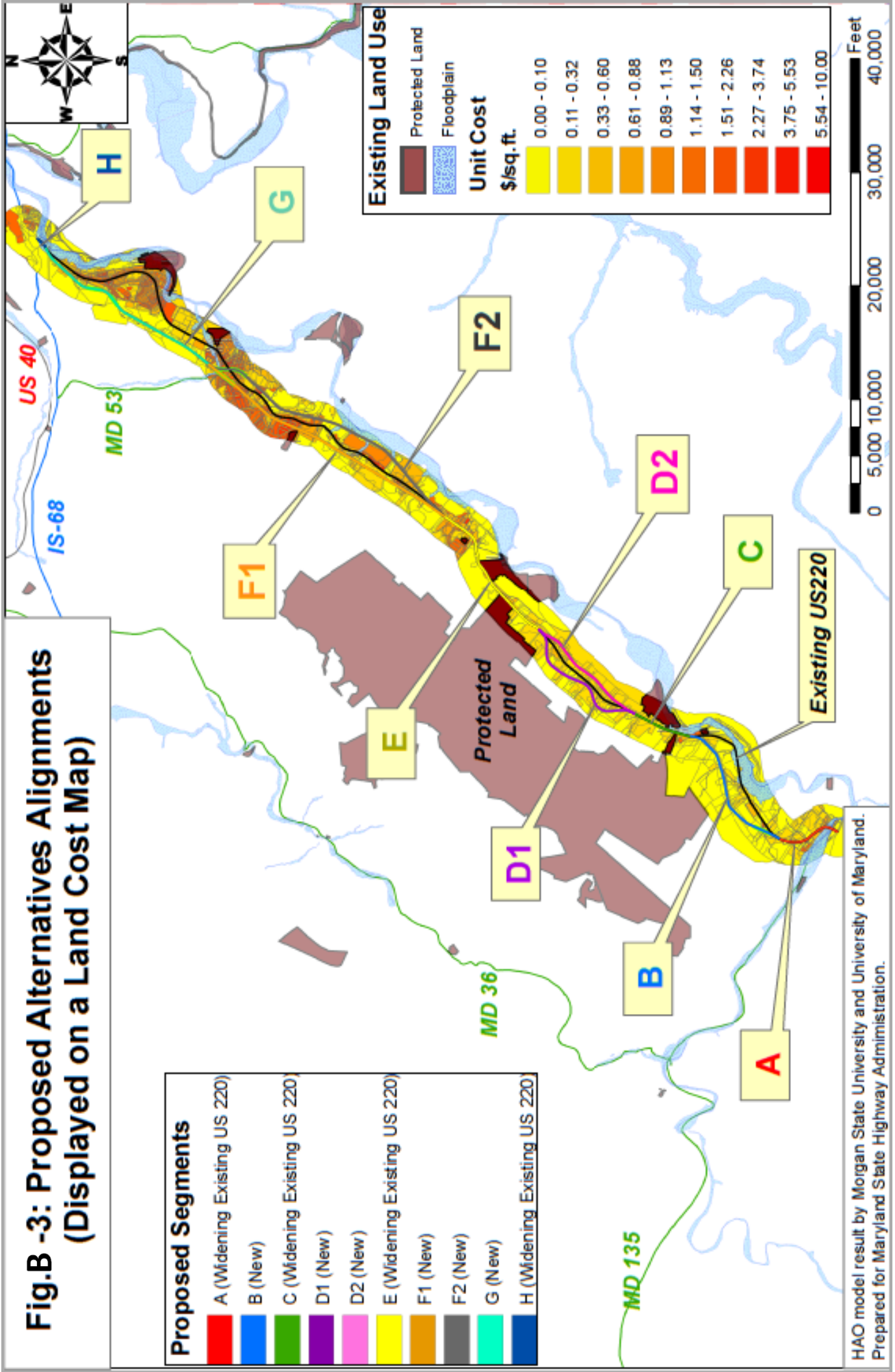
- Protected Land
- Floodplain

Ground Elevation (meter)

High : 496
Low : 180

HAO model result by Morgan State University and University of Maryland.
Prepared for Maryland State Highway Administration.

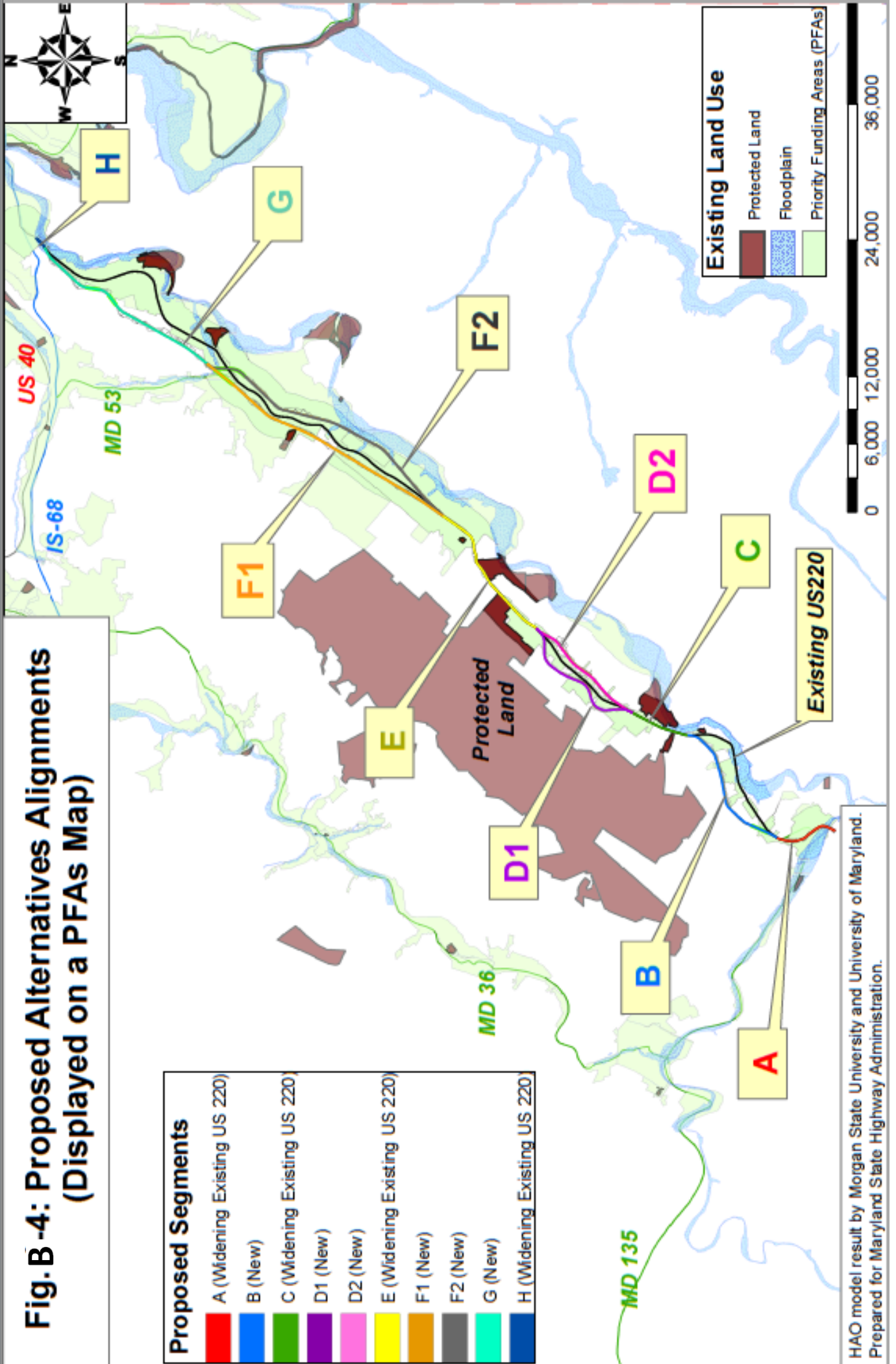
**Fig.B -3: Proposed Alternatives Alignments
(Displayed on a Land Cost Map)**



HAO model result by Morgan State University and University of Maryland.
Prepared for Maryland State Highway Administration.

**Fig. B-4: Proposed Alternatives Alignments
(Displayed on a PFAs Map)**

Proposed Segments	
█	A (Widening Existing US 220)
█	B (New)
█	C (Widening Existing US 220)
█	D1 (New)
█	D2 (New)
█	E (Widening Existing US 220)
█	F1 (New)
█	F2 (New)
█	G (New)
█	H (Widening Existing US 220)

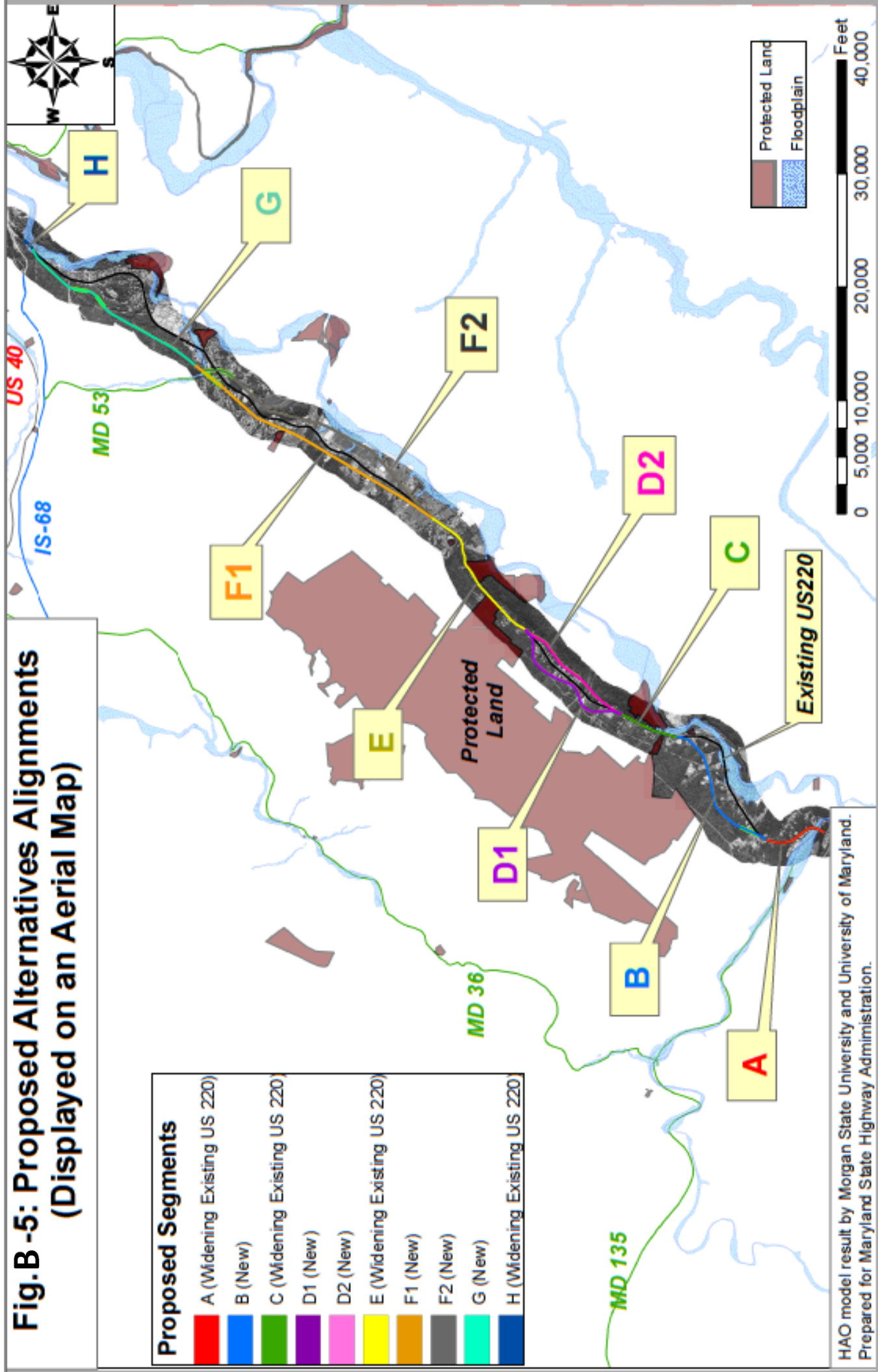


Existing Land Use	
█	Protected Land
█	Floodplain
█	Priority Funding Areas (PFAs)



HAO model result by Morgan State University and University of Maryland.
Prepared for Maryland State Highway Administration.

**Fig. B -5: Proposed Alternatives Alignments
(Displayed on an Aerial Map)**



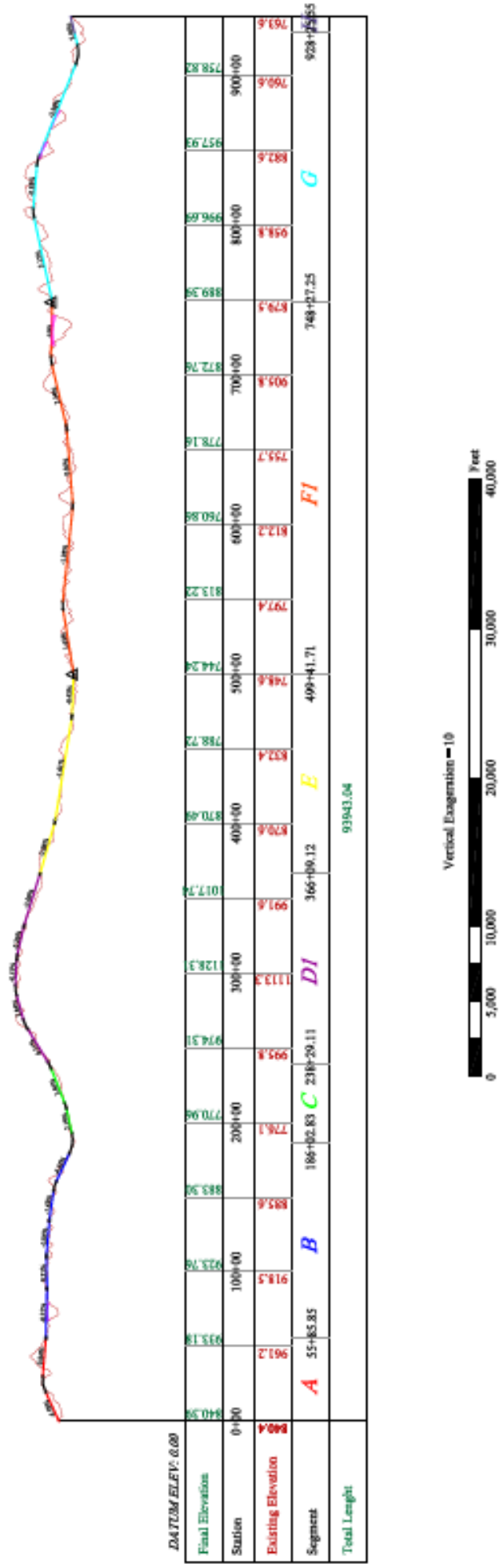
Proposed Segments	
█	A (Widening Existing US 220)
█	B (New)
█	C (Widening Existing US 220)
█	D1 (New)
█	D2 (New)
█	E (Widening Existing US 220)
█	F1 (New)
█	F2 (New)
█	G (New)
█	H (Widening Existing US 220)

█	Protected Land
█	Floodplain

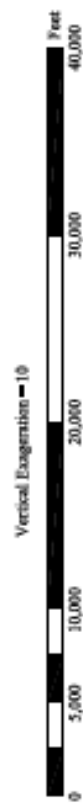
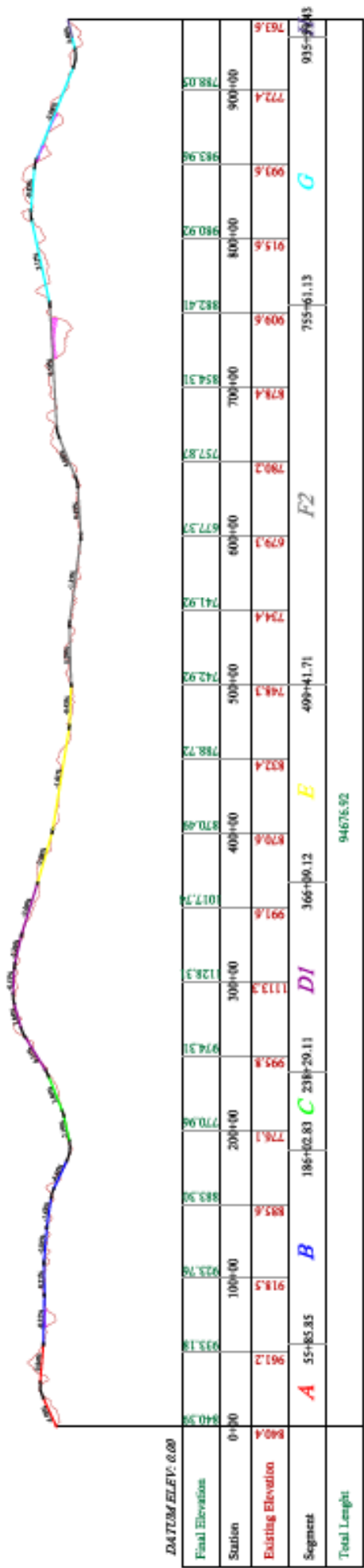


HAC model result by Morgan State University and University of Maryland.
Prepared for Maryland State Highway Administration.

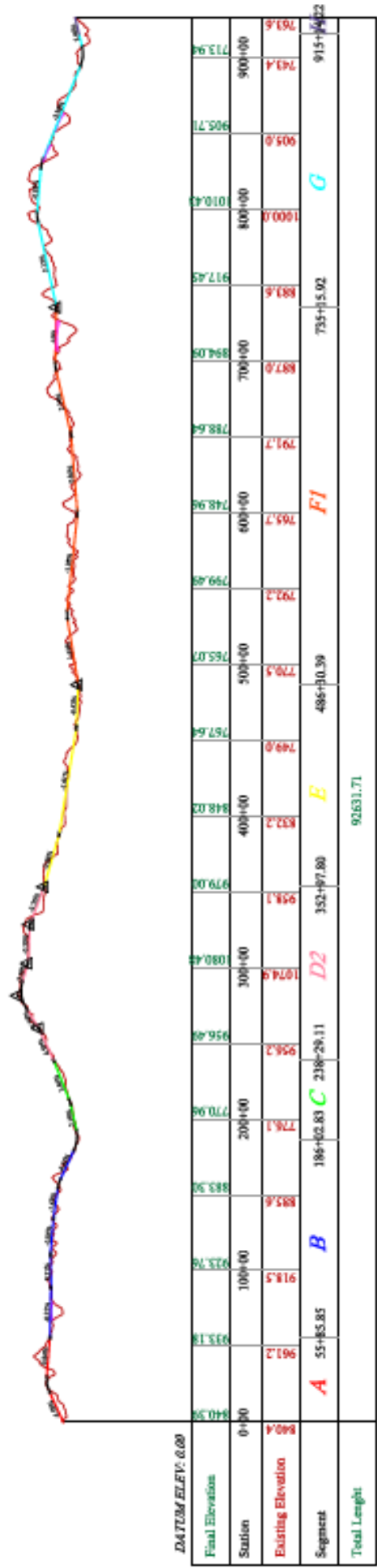
**Fig. B-6: Vertical Profile for Alt1
(A-B-C-D1-E-F1-G-H)**



**Fig. B-7: Vertical Profile for Alt2
(A-B-C-D1-E-F2-G-H)**



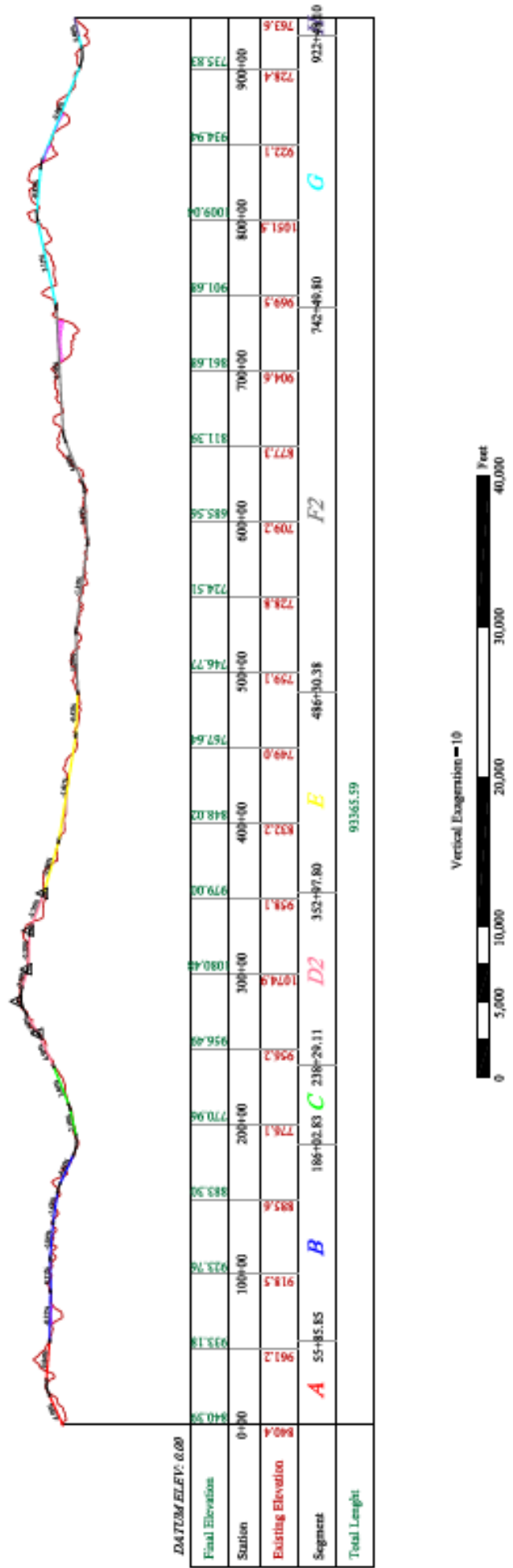
**Fig. B-8: Vertical Profile for Alt3
(A-B-C-D2-E-F1-G-H)**



Vertical Exaggeration = 10

0 5,000 10,000 20,000 30,000 40,000 Feet

**Fig. B-9: Vertical Profile for Alt4
(A-B-C-D2-E-F2-G-H)**



Appendix C: Earthwork Volume Table

Segment A

Segment: A

Station	END AREA VOLUME LISTING WITH CURVE CORRECTION						
	Cut Area (sqft)	Fill Area (sqft)	Cut 1.1000 Volume (yds)	Fill 0.9000 Volume (yds)	Cut 1.1000 Tot Vol (yds)	Fill 0.9000 Tot Vol (yds)	Mass Ordinate
0+00	40.57	52.19					
0+50	458.40	6.62	508.22	49.01	508.22	49.01	459.21
1+00	303.01	32.80	775.51	32.85	1283.73	81.86	1201.87
1+50	64.48	225.24	374.29	215.03	1658.02	296.90	1361.13
2+00	0.00	1260.62	65.68	1238.22	1723.70	1535.11	188.59
2+50	0.00	2737.14	0.00	3331.47	1723.70	4866.58	-3142.88
3+00	0.00	4518.84	0.00	6046.65	1723.70	10913.23	-9189.53
3+50	0.00	6158.32	0.00	8897.63	1723.70	19810.86	-18087.16
4+00	0.00	7126.90	0.00	11071.02	1723.70	30881.89	-29158.19
4+50	0.00	7560.15	0.00	12239.21	1723.70	43121.10	-41397.40
5+00	0.00	8091.21	0.00	13042.80	1723.70	56163.90	-54440.20
5+50	0.00	8240.93	0.00	13610.12	1723.70	69774.02	-68050.32
6+00	0.00	8544.19	0.00	13987.60	1723.70	83761.62	-82037.92
6+50	0.00	9554.28	0.00	15082.06	1723.70	98843.68	-97119.98
7+00	0.00	10266.66	0.00	16517.45	1723.70	115361.12	-113637.42
7+50	0.00	10474.63	0.00	17284.41	1723.70	132645.53	-130921.84
8+00	0.00	10263.59	0.00	17281.85	1723.70	149927.39	-148203.69
8+50	0.00	9924.90	0.00	16823.74	1723.70	166751.12	-165027.42
9+00	0.00	9774.77	0.00	16416.39	1723.70	183167.51	-181443.81
9+50	0.00	9780.61	0.00	16296.15	1723.70	199463.66	-197739.96
10+00	0.00	10167.28	0.00	16623.24	1723.70	216086.90	-214363.20
10+50	0.00	10660.47	0.00	17356.46	1723.70	233443.35	-231719.66
11+00	0.00	11108.56	0.00	18140.86	1723.70	251584.22	-249860.52
11+50	0.00	10419.29	0.00	17939.88	1723.70	269524.09	-267800.40
12+00	0.00	9615.31	0.00	16695.50	1723.70	286219.60	-284495.90
12+50	0.00	8534.60	0.00	15124.92	1723.70	301344.52	-299620.82
13+00	0.00	7337.33	0.00	13226.60	1723.70	314571.12	-312847.42
13+50	0.00	6578.37	0.00	11596.41	1723.70	326167.53	-324443.83
14+00	0.00	6171.09	0.00	10624.55	1723.70	336792.09	-335068.39
14+50	0.00	5996.27	0.00	10139.47	1723.70	346931.55	-345207.85
15+00	0.00	6159.87	0.00	10130.12	1723.70	357061.67	-355337.97
15+50	0.00	6811.42	0.00	10809.41	1723.70	367871.08	-366147.39
16+00	0.00	7438.53	0.00	11874.96	1723.70	379746.04	-378022.35
16+50	0.00	7837.85	0.00	12730.32	1723.70	392476.36	-390752.66
17+00	0.00	7952.37	0.00	13158.52	1723.70	405634.88	-403911.18
17+50	0.00	7927.31	0.00	13233.06	1723.70	418867.94	-417144.24
18+00	0.00	7442.69	0.00	12808.33	1723.70	431676.27	-429952.57
18+50	0.00	6509.39	0.00	11626.73	1723.70	443303.00	-441579.30
19+00	0.00	5472.74	0.00	9985.11	1723.70	453288.11	-451564.41
19+50	0.00	4209.25	0.00	8068.33	1723.70	461356.43	-459632.73
			5914.02		1723.70	467270.45	-465546.75

20+00	0.00	2887.57	0.00	3955.99	1723.70	471226.44	-469502.74
20+50	0.00	1859.61	105.95	2390.33	1829.65	473616.77	-471787.12
21+00	104.03	1008.79	774.24	1256.09	2603.90	474872.85	-472268.96
21+50	656.14	498.52	1617.12	674.12	4221.02	475546.97	-471325.95
22+00	931.58	310.42	2131.24	537.63	6352.26	476084.60	-469732.34
22+50	1160.92	334.73	2601.69	559.43	8953.95	476644.02	-467690.08
23+00	1393.47	336.59	3074.57	547.87	12028.51	477191.89	-465163.38
23+50	1625.20	320.86	3507.68	519.20	15536.19	477711.09	-462174.90
24+00	1818.71	302.18	3804.89	443.23	19341.08	478154.32	-458813.24
24+50	1917.00	229.69	3892.41	284.87	23233.49	478439.19	-455205.70
25+00	1904.63	112.15	3708.86	281.24	26942.35	478720.43	-451778.07
25+50	1736.80	225.33	3334.64	374.89	30276.99	479095.31	-448818.32
26+00	1537.21	224.53	2935.05	383.73	33212.04	479479.04	-446267.00
26+50	1344.47	235.95	2331.27	546.09	35543.31	480025.13	-444481.82
27+00	944.41	419.36	1472.15	1212.25	37015.45	481237.38	-444221.92
27+50	500.98	1035.34	697.90	2270.74	37713.35	483508.12	-445794.76
28+00	184.23	1689.54	228.35	3246.94	37941.71	486755.06	-448813.35
28+50	39.97	2206.79	46.69	4233.55	37988.39	490988.61	-453000.22
29+00	5.87	2873.47	5.98	5510.40	37994.37	496499.01	-458504.64
29+50	0.00	3739.01	0.00	7323.13	37994.37	503822.14	-465827.78
30+00	0.00	5048.75	0.00	10208.48	37994.37	514030.62	-476036.25
30+50	0.00	7201.42	0.00	13772.09	37994.37	527802.71	-489808.35
31+00	0.00	9325.09	0.00	16934.24	37994.37	544736.95	-506742.58
31+50	0.00	10996.00	0.00	19101.99	37994.37	563838.93	-525844.57
32+00	0.00	11926.39	0.00	19775.44	37994.37	583614.37	-545620.01
32+50	0.00	11804.14	0.00	19101.83	37994.37	602716.20	-564721.83
33+00	0.00	11118.05	0.00	17676.51	37994.37	620392.71	-582398.35
33+50	0.00	10093.76	0.00	15397.13	37994.37	635789.84	-597795.48
34+00	0.00	8382.79	0.00	11821.50	37994.37	647611.34	-609616.98
34+50	0.00	5803.01	0.00	7200.33	37994.37	654811.68	-616817.31
35+00	0.00	2837.39	66.52	2792.83	38060.88	657604.51	-619543.63
35+50	65.31	514.01	1527.37	428.34	39588.26	658032.85	-618444.60
36+00	1434.29	0.00	5023.75	0.00	44612.01	658032.85	-613420.85
36+50	3498.12	0.00	8943.07	0.00	53555.08	658032.85	-604477.77
37+00	5282.35	0.00	13069.18	0.00	66624.26	658032.85	-591408.60
37+50	7549.20	0.00	17592.30	0.00	84216.55	658032.85	-573816.30
38+00	9723.24	0.00	21225.32	0.00	105441.87	658032.85	-552590.98
38+50	11116.17	0.00	23556.52	0.00	128998.39	658032.85	-529034.46
39+00	12012.05	0.00	24975.38	0.00	153973.77	658032.85	-504059.08
39+50	12509.23	0.00	26038.22	0.00	180011.99	658032.85	-478020.86
40+00	13055.57	0.00	27582.92	0.00	207594.91	658032.85	-450437.95
40+50	14025.84	0.00	30507.09	0.00	238102.00	658032.85	-419930.85
41+00	15926.58	0.00	34659.22	0.00	272761.22	658032.85	-385271.63
41+50	18102.47	0.00	39765.83	0.00	312527.05	658032.85	-345505.80
42+00	20940.34	0.00	46103.33	0.00	358630.38	658032.85	-299402.47
42+50	24324.75	0.00	52114.96	0.00	410745.35	658032.85	-247287.51
43+00	26842.67	0.00	56760.21	0.00	467505.56	658032.85	-190527.30
43+50	28885.53	0.00					

44+00	28307.29	0.00	58251.95	0.00	525757.51	658032.85	-132275.34
44+50	26871.50	0.00	56200.63	0.00	581958.14	658032.85	-76074.72
45+00	23881.06	0.00	51692.42	0.00	633650.56	658032.85	-24382.29
45+50	20572.76	0.00	45277.03	0.00	678927.59	658032.85	20894.74
46+00	18103.08	0.00	39392.06	0.00	718319.65	658032.85	60286.80
46+50	15991.54	0.00	34726.00	0.00	753045.65	658032.85	95012.80
47+00	14810.69	0.00	31372.64	0.00	784418.28	658032.85	126385.43
47+50	13530.72	0.00	28866.24	0.00	813284.53	658032.85	155251.67
48+00	11795.71	0.00	25795.43	0.00	839079.96	658032.85	181047.10
48+50	10163.63	0.00	22365.99	0.00	861445.95	658032.85	203413.09
49+00	8279.96	0.00	18785.13	0.00	880231.08	658032.85	222198.23
49+50	6427.52	0.00	14979.84	0.00	895210.92	658032.85	237178.07
50+00	5071.69	0.00	11712.17	0.00	906923.09	658032.85	248890.24
50+50	4089.96	0.00	9331.31	0.00	916254.40	658032.85	258221.55
51+00	3906.67	0.00	8144.71	0.00	924399.11	658032.85	266366.26
51+50	4005.03	0.00	8058.22	0.00	932457.33	658032.85	274424.48
52+00	3890.66	0.00	8041.91	0.00	940499.24	658032.85	282466.38
52+50	3558.76	0.00	7587.37	0.00	948086.61	658032.85	290053.75
53+00	2727.71	0.00	6402.89	0.00	954489.50	658032.85	296456.64
53+50	1791.68	0.00	4603.09	0.00	959092.58	658032.85	301059.73
54+00	1333.07	0.00	3182.62	0.00	962275.20	658032.85	304242.35
54+50	730.01	0.00	2101.29	0.00	964376.50	658032.85	306343.64
55+00	226.55	0.00	974.28	0.00	965350.77	658032.85	307317.92
55+50	138.99	0.01	372.31	0.00	965723.09	658032.86	307690.23
55+85.85	129.36	8.35	195.99	4.99	965919.08	658037.85	307881.23

Segment B

Segment: B

END AREA VOLUME LISTING WITH CURVE CORRECTION								
Station	Cut		Fill		Cut		Fill	
	Area (sqft)	Area (sqft)	Volume (yds)	Volume (yds)	Tot Vol (yds)	Tot Vol (yds)	Tot Vol (yds)	Mass Ordinate
0+00	26.72	308.25		72.81	583.56	72.81	583.56	-510.75
0+50	44.76	392.02		113.98	671.86	186.79	1255.42	-1068.63
1+00	67.15	414.22		126.37	630.81	313.16	1886.23	-1573.07
1+43.65	74.98	452.93		18.84	97.01	332.00	1983.24	-1651.23
1+50	70.58	463.32		85.12	867.64	417.12	2850.88	-2433.76
2+00	12.85	578.75		13.12	1164.41	430.24	4015.29	-3585.05
2+50	0.00	820.66		0.00	1589.35	430.24	5604.64	-5174.40
3+00	0.00	1090.05		0.00	1980.88	430.24	7585.53	-7155.29
3+50	0.00	1292.23		0.00	2405.62	430.24	9991.15	-9560.91
4+00	0.00	1600.68		0.00	2987.31	430.24	12978.46	-12548.22
4+50	0.00	1988.75		0.00	3594.93	430.24	16573.39	-16143.15
5+00	0.00	2326.96		0.00	3527.83	430.24	20101.22	-19670.98
5+43.65	0.00	2524.11		0.00	536.74	430.24	20637.95	-20207.71
5+50	0.00	2547.84		0.00	3537.41	430.24	24175.37	-23745.12
5+90.62	0.00	2681.83		0.00	845.01	430.24	25020.38	-24590.14
6+00	0.00	2716.70		0.00	4699.43	430.24	29719.81	-29289.57
6+50	0.00	2914.92		0.00	5174.40	430.24	34894.21	-34463.97
7+00	0.00	3280.31		0.00	5868.97	430.24	40763.18	-40332.94
7+50	0.00	3739.30		0.00	6474.96	430.24	47238.14	-46807.90
8+00	0.00	4004.63		0.00	6611.44	430.24	53849.58	-53419.34
8+50	0.00	3905.79		0.00	6224.59	430.24	60074.17	-59643.93
9+00	0.00	3547.69		0.00	5434.98	430.24	65509.15	-65078.91
9+50	0.00	2966.92		0.00	3795.33	430.24	69304.48	-68874.24
9+90.62	0.00	2637.30		0.00	819.70	430.24	70124.18	-69693.94
10+00	0.00	2605.44		0.00	4450.22	430.24	74574.40	-74144.16
10+50	0.00	2734.83		0.00	5199.21	430.24	79773.61	-79343.37
11+00	0.00	3504.22		0.00	7140.21	430.24	86913.82	-86483.58
11+50	0.00	5064.03		0.00	9782.52	430.24	96696.34	-96266.10
12+00	0.00	6674.99		0.00	12551.56	430.24	109247.91	-108817.67
12+50	0.00	8386.88		0.00	15646.11	430.24	124894.01	-124463.77
13+00	0.00	10388.45		0.00	19368.42	430.24	144262.43	-143832.19
13+50	0.00	12853.65		0.00	23912.43	430.24	168174.86	-167744.62
14+00	0.00	15841.26		0.00	29366.16	430.24	197541.02	-197110.78
14+50	0.00	19398.13		0.00	35009.11	430.24	232550.14	-232119.90
15+00	0.00	22612.80		0.00	39344.92	430.24	271895.05	-271464.81
15+50	0.00	24601.10		0.00	41739.70	430.24	313634.75	-313204.51
16+00	0.00	25486.55		0.00	42757.43	430.24	356392.18	-355961.94
16+50	0.00	25822.37		0.00	42918.75	430.24	399310.93	-398880.69
17+00	0.00	25680.13		0.00	42433.90	430.24	441744.83	-441314.59
17+50	0.00	25240.56		0.00	41568.85	430.24	483313.69	-482883.44
18+00	0.00	24642.07		0.00	40606.02	430.24	523919.70	-523489.46
18+50	0.00	24085.15						

19+00	0.00	23087.51	0.00	39310.55	430.24	563230.25	-562800.01
19+50	0.00	21104.83	0.00	36826.94	430.24	600057.19	-599626.95
20+00	0.00	17889.62	0.00	32495.37	430.24	632552.56	-632122.32
20+50	0.00	14366.68	0.00	26880.25	430.24	659432.81	-659002.57
21+00	0.00	11036.10	0.00	21168.98	430.24	680601.79	-680171.55
21+50	0.00	8302.60	0.00	16115.58	430.24	696717.37	-696287.13
22+00	0.00	6435.40	0.00	12281.66	430.24	708999.04	-708568.80
22+50	0.00	5260.29	0.00	9746.41	430.24	718745.45	-718315.21
23+00	0.00	4315.04	0.00	7979.45	430.24	726724.90	-726294.66
23+50	0.00	3527.43	0.00	6535.40	430.24	733260.29	-732830.05
24+00	0.00	2771.19	0.00	5248.85	430.24	738509.14	-738078.90
24+50	0.00	1981.75	0.00	3960.78	430.24	742469.92	-742039.68
25+00	0.00	1310.68	0.00	2743.69	430.24	745213.61	-744783.37
25+50	0.00	666.73	0.00	1647.84	430.24	746861.45	-746431.21
26+00	0.06	550.03	0.06	1013.97	430.30	747875.42	-747445.12
26+50	7.05	927.93	7.24	1231.63	437.54	749107.05	-748669.51
27+00	0.87	1305.20	8.06	1860.94	445.60	750968.00	-750522.40
27+50	1.33	1569.69	2.24	2395.74	447.84	753363.74	-752915.90
27+99.28	0.09	1715.76	1.43	2698.19	449.26	756061.93	-755612.66
28+00	0.08	1717.83	0.00	41.48	449.27	756103.40	-755654.14
28+50	6.49	1839.07	6.72	2958.09	455.98	759061.49	-758605.51
29+00	19.58	1811.52	26.84	3022.03	482.82	762083.52	-761600.70
29+50	34.06	1635.12	55.59	2840.39	538.41	764923.91	-764385.50
30+00	61.07	1456.43	99.26	2538.23	637.67	767462.14	-766824.47
30+50	55.21	1265.55	122.13	2227.62	759.80	769689.77	-768929.96
31+00	34.44	1034.07	94.77	1877.43	854.58	771567.20	-770712.62
31+50	25.02	764.48	63.24	1466.98	917.82	773034.18	-772116.36
31+99.28	33.09	365.66	61.21	907.03	979.03	773941.21	-772962.18
32+00	34.86	357.51	1.05	8.52	980.09	773949.73	-772969.64
32+19.60	120.99	163.66	64.89	165.29	1044.98	774115.02	-773070.04
32+50	339.74	26.07	277.16	99.62	1322.14	774214.64	-772892.50
33+00	749.62	0.00	1096.99	22.12	2419.13	774236.76	-771817.63
33+50	1059.94	0.00	1844.80	0.00	4263.93	774236.76	-769972.83
34+00	1074.95	0.00	2184.13	0.00	6448.05	774236.76	-767788.71
34+50	973.27	0.00	2100.67	0.00	8548.72	774236.76	-765688.03
35+00	926.44	0.00	1949.46	0.00	10498.18	774236.76	-763738.58
35+50	1141.76	0.00	2116.55	0.00	12614.73	774236.76	-761622.03
36+00	1363.04	0.00	2554.71	0.00	15169.44	774236.76	-759067.32
36+19.60	1459.05	0.00	1126.77	0.00	16296.20	774236.76	-757940.56
36+50	1648.73	0.00	1924.69	0.00	18220.89	774236.76	-756015.87
37+00	1969.17	0.00	3684.90	0.00	21905.79	774236.76	-752330.97
37+50	2436.24	0.00	4486.99	0.00	26392.78	774236.76	-747843.98
38+00	2746.52	0.00	5278.74	0.00	31671.52	774236.76	-742565.23
38+50	2616.96	0.00	5462.81	0.00	37134.33	774236.76	-737102.42
39+00	1767.56	0.00	4465.72	0.00	41600.05	774236.76	-732636.70
39+50	833.35	0.00	2649.08	0.00	44249.13	774236.76	-729987.63
40+00	233.53	28.48	1086.64	23.73	45335.77	774260.49	-728924.72
			292.11	285.64	45627.88	774546.13	-728918.25

40+50	53.27	314.29						
41+00	51.15	615.52	106.35	774.84	45734.24	775320.97	-729586.74	
41+50	48.34	840.92	101.33	1213.70	45835.56	776534.67	-730699.11	
42+00	5.61	1098.85	54.94	1616.48	45890.51	778151.15	-732260.64	
42+50	0.00	1492.26	5.71	2159.26	45896.22	780310.41	-734414.19	
43+00	0.00	1956.88	0.00	2874.28	45896.22	783184.69	-737288.47	
43+50	0.00	2508.12	0.00	3720.83	45896.22	786905.52	-741009.30	
44+00	0.00	1979.36	0.00	3739.57	45896.22	790645.09	-744748.87	
44+50	0.00	1128.66	0.00	2590.02	45896.22	793235.11	-747338.89	
45+00	88.48	376.95	90.12	1254.68	45986.34	794489.79	-748503.45	
45+50	473.07	166.56	571.95	452.93	46558.28	794942.71	-748384.43	
46+00	726.89	97.93	1222.18	220.41	47780.47	795163.13	-747382.66	
46+50	777.76	87.37	1532.52	154.42	49312.98	795317.55	-746004.57	
47+00	656.75	199.81	1461.07	239.32	50774.06	795556.88	-744782.82	
47+50	280.55	374.70	954.66	478.76	51728.72	796035.64	-744306.92	
47+50.93	270.48	378.79	10.45	11.69	51739.16	796047.33	-744308.16	
48+00	7.47	970.05	278.64	1100.94	52017.80	797148.26	-745130.46	
48+50	0.00	1794.90	7.65	2295.40	52025.45	799443.66	-747418.21	
49+00	0.00	2450.38	0.00	3517.46	52025.45	802961.12	-750935.67	
49+50	0.00	3116.55	0.00	4597.88	52025.45	807559.00	-755533.55	
50+00	0.00	3187.94	0.00	5183.41	52025.45	812742.40	-760716.95	
50+50	1.74	2598.81	1.81	4721.81	52027.26	817464.22	-765436.96	
51+00	28.40	2339.09	32.08	3987.12	52059.34	821451.34	-769392.00	
51+50	44.47	2568.70	78.03	3929.83	52137.37	825381.16	-773243.79	
51+50.93	44.39	2577.31	1.78	76.55	52139.15	825457.71	-773318.56	
52+00	17.35	3008.99	65.14	4383.00	52204.30	829840.71	-777636.42	
52+50	0.00	3533.24	18.16	5238.70	52222.46	835079.41	-782856.95	
53+00	0.00	4247.79	0.00	6254.95	52222.46	841334.36	-789111.90	
53+50	0.00	5222.40	0.00	7657.05	52222.46	848991.41	-796768.95	
54+00	0.00	6401.27	0.00	9446.47	52222.46	858437.88	-806215.42	
54+50	0.00	7773.70	0.00	11558.62	52222.46	869996.50	-817774.04	
55+00	0.00	8823.52	0.00	13555.97	52222.46	883552.47	-831330.01	
55+50	0.00	9349.43	0.00	14856.21	52222.46	898408.69	-846186.23	
56+00	0.00	9163.80	0.00	15142.18	52222.46	913550.87	-861328.41	
56+05.45	0.00	9094.82	0.00	1626.86	52222.46	915177.72	-862955.26	
56+50	0.00	8192.93	0.00	13067.73	52222.46	928245.45	-876022.99	
57+00	0.00	6544.96	0.00	12479.47	52222.46	940724.92	-888502.46	
57+50	0.00	4769.01	0.00	9561.32	52222.46	950286.25	-898063.79	
58+00	0.00	3340.69	0.00	6838.44	52222.46	957124.69	-904902.23	
58+50	0.00	2232.78	0.00	4689.50	52222.46	961814.19	-909591.73	
59+00	0.00	2092.68	0.00	3629.20	52222.46	965443.39	-913220.93	
59+50	0.00	2399.08	0.00	3755.73	52222.46	969199.13	-916976.67	
60+00	0.00	3340.38	0.00	4787.49	52222.46	973986.61	-921764.15	
60+05.45	0.00	3448.21	0.00	616.34	52222.46	974602.95	-922380.49	
60+50	0.00	4264.82	0.00	5727.32	52222.46	980330.27	-928107.81	
61+00	0.00	5454.99	0.00	8099.84	52222.46	988430.11	-936207.65	
61+50	0.00	6894.96	0.00	10291.62	52222.46	998721.73	-946499.27	
62+00	0.00	7872.01	0.00	12305.81	52222.46	1011027.54	-958805.08	

62+50	0.00	8297.62	0.00	13474.69	52222.46	1024502.23	-972279.77
63+00	0.00	6186.36	0.00	12069.98	52222.46	1036572.22	-984349.76
63+50	0.00	3906.91	0.00	8411.06	52222.46	1044983.27	-992760.81
64+00	0.00	2675.65	0.00	5485.47	52222.46	1050468.74	-998246.28
64+50	0.00	1897.69	0.00	3811.12	52222.46	1054279.86	-1002057.40
65+00	0.00	1305.26	0.00	2669.13	52222.46	1056948.99	-1004726.53
65+50	0.00	692.54	0.00	1664.84	52222.46	1058613.83	-1006391.37
66+00	0.00	550.19	0.00	1035.61	52222.46	1059649.44	-1007426.98
66+50	0.00	901.50	0.00	1209.74	52222.46	1060859.18	-1008636.72
67+00	0.00	1561.62	0.00	2052.60	52222.46	1062911.78	-1010689.32
67+50	0.00	2391.24	0.00	3294.05	52222.46	1066205.83	-1013983.37
68+00	0.00	2617.88	0.00	4174.27	52222.46	1070380.10	-1018157.64
68+50	0.00	2668.65	0.00	4405.45	52222.46	1074785.55	-1022563.08
69+00	0.00	1749.35	0.00	3681.67	52222.46	1078467.21	-1026244.75
69+50	0.00	804.76	0.00	2128.43	52222.46	1080595.64	-1028373.18
70+00	0.00	793.75	0.00	1332.09	52222.46	1081927.73	-1029705.27
70+50	0.00	1073.67	0.00	1556.18	52222.46	1083483.91	-1031261.45
71+00	0.00	1904.68	0.00	2481.96	52222.46	1085965.87	-1033743.41
71+50	0.00	2869.84	0.00	3978.77	52222.46	1089944.64	-1037722.18
72+00	0.00	4023.12	0.00	5744.13	52222.46	1095688.77	-1043466.31
72+50	0.00	5143.73	0.00	7639.04	52222.46	1103327.81	-1051105.34
73+00	0.00	5719.44	0.00	9052.64	52222.46	1112380.44	-1060157.98
73+12.16	0.00	5849.95	0.00	2345.52	52222.46	1114725.96	-1062503.50
73+50	0.00	6227.42	0.00	7617.57	52222.46	1122343.53	-1070121.07
74+00	0.00	5857.95	0.00	10078.58	52222.46	1132422.10	-1080199.64
74+50	0.00	5264.97	0.00	9281.98	52222.46	1141704.08	-1089481.62
75+00	0.00	3902.35	0.00	7655.72	52222.46	1149359.80	-1097137.34
75+50	0.00	2612.04	0.00	5446.10	52222.46	1154805.90	-1102583.44
76+00	2.32	1571.46	2.35	3503.40	52224.81	1158309.29	-1106084.48
76+50	148.70	765.48	152.16	1962.07	52376.97	1160271.36	-1107894.39
77+00	415.19	559.48	568.03	1115.35	52945.00	1161386.71	-1108441.71
77+12.16	462.52	518.55	215.14	221.03	53160.14	1161607.74	-1108447.60
77+50	620.14	420.77	825.60	599.26	53985.74	1162207.00	-1108221.26
78+00	834.73	527.50	1466.38	799.64	55452.12	1163006.64	-1107554.52
78+28.77	944.67	585.51	1031.59	540.08	56483.71	1163546.72	-1107063.01
78+50	1016.70	623.38	857.51	422.73	57341.22	1163969.45	-1106628.23
79+00	1219.69	679.75	2301.18	1074.07	59642.40	1165043.51	-1105401.12
79+50	1434.85	740.89	2728.16	1172.21	62370.56	1166215.72	-1103845.17
80+00	1512.56	787.45	3025.91	1262.94	65396.47	1167478.66	-1102082.19
80+50	1160.91	829.46	2740.58	1338.33	68137.05	1168816.99	-1100679.94
81+00	712.08	1204.77	1917.01	1686.68	70054.06	1170503.66	-1100449.61
81+50	254.60	1670.27	988.06	2388.43	71042.12	1172892.09	-1101849.98
82+00	28.12	2325.45	288.50	3325.35	71330.62	1176217.44	-1104886.82
82+28.77	0.00	2722.42	16.48	2419.77	71347.10	1178637.21	-1107290.11
82+50	0.00	3015.70	0.00	2030.34	71347.10	1180667.56	-1109320.45
83+00	0.00	3664.49	0.00	5566.82	71347.10	1186234.38	-1114887.28
83+50	0.00	4072.94	0.00	6447.86	71347.10	1192682.24	-1121335.14
			0.00	7263.10	71347.10	1199945.34	-1128598.24

84+00	0.00	4642.78						
84+50	0.00	4944.67	0.00	7989.54	71347.10	1207934.88	-1136587.77	
85+00	0.00	4947.81	0.00	8243.73	71347.10	1216178.60	-1144831.50	
85+50	0.00	4473.31	0.00	7850.93	71347.10	1224029.53	-1152682.43	
86+00	0.00	4024.09	0.00	7081.16	71347.10	1231110.69	-1159763.59	
86+50	0.00	3338.19	0.00	6135.24	71347.10	1237245.93	-1165898.82	
87+00	0.00	2469.54	0.00	4839.78	71347.10	1242085.70	-1170738.60	
87+50	0.00	1761.40	0.00	3525.79	71347.10	1245611.49	-1174264.39	
88+00	0.00	933.05	0.00	2245.38	71347.10	1247856.87	-1176509.76	
88+50	0.72	429.91	204.02	1135.80	71347.84	1248992.67	-1177644.83	
89+00	199.59	0.00	1217.52	358.26	71551.86	1249350.93	-1177799.07	
89+50	995.79	0.00	2462.26	0.00	72769.38	1249350.93	-1176581.55	
90+00	1421.70	0.00	3136.25	0.00	75231.63	1249350.93	-1174119.30	
90+50	1657.53	0.00	3524.03	0.00	78367.89	1249350.93	-1170983.04	
91+00	1802.43	0.00	3429.92	0.00	81891.92	1249350.93	-1167459.01	
91+50	1565.13	0.00	2953.78	0.00	85321.84	1249350.93	-1164029.09	
92+00	1334.95	0.00	2486.53	0.00	88275.62	1249350.93	-1161075.31	
92+50	1106.37	0.00	1970.73	0.00	90762.15	1249350.93	-1158588.78	
93+00	828.52	0.00	1242.36	0.00	92732.87	1249350.93	-1156618.06	
93+50	391.24	0.00	464.54	113.71	93975.23	1249350.93	-1155375.70	
94+00	64.85	136.46	66.23	651.95	94439.77	1249464.64	-1155024.87	
94+50	0.18	645.88	0.19	1667.45	94506.00	1250116.59	-1155610.59	
95+00	0.00	1355.06	0.00	2227.06	94506.19	1251784.04	-1157277.85	
95+38.54	0.00	2111.70	0.00	849.45	94506.19	1254011.10	-1159504.91	
95+50	0.00	2338.13	0.00	4648.32	94506.19	1254860.55	-1160354.36	
96+00	0.00	3245.57	0.00	6036.58	94506.19	1259508.87	-1165002.68	
96+50	0.00	4010.11	0.00	7146.51	94506.19	1265545.45	-1171039.26	
97+00	0.00	4578.93	0.00	7397.46	94506.19	1272691.96	-1178185.77	
97+50	0.00	4308.05	0.00	6855.06	94506.19	1280089.42	-1185583.23	
98+00	0.00	3913.11	0.00	6129.26	94506.19	1286944.47	-1192438.28	
98+50	0.00	3411.08	0.00	5228.73	94506.19	1293073.73	-1198567.54	
99+00	0.00	2803.28	0.00	3333.98	94506.19	1298302.47	-1203796.28	
99+38.54	0.00	2305.57	0.00	872.41	94506.19	1301636.45	-1207130.26	
99+50	0.00	2177.34	0.00	3203.63	94506.19	1302508.85	-1208002.66	
100+00	0.00	1584.95	35.45	2322.14	94506.19	1305712.48	-1211206.29	
100+50	35.77	1125.27	207.14	1568.45	94541.64	1308034.62	-1213492.97	
101+00	178.88	692.72	910.27	781.06	94748.78	1309603.07	-1214854.28	
101+50	756.84	208.38	1834.30	142.03	95659.05	1310384.13	-1214725.07	
101+90.05	1570.33	0.00	711.17	0.00	97493.35	1310526.16	-1213032.81	
102+00	1844.87	0.00	5521.38	0.00	98204.53	1310526.16	-1212321.63	
102+50	3467.69	0.00	8935.54	0.00	103725.91	1310526.16	-1206800.25	
103+00	5192.27	0.00	12436.67	0.00	112661.44	1310526.16	-1197864.72	
103+50	6912.16	0.00	15993.49	0.00	125098.12	1310526.16	-1185428.04	
104+00	8711.23	0.00	19621.48	0.00	141091.60	1310526.16	-1169434.56	
104+50	10510.75	0.00	23087.61	0.00	160713.08	1310526.16	-1149813.07	
105+00	12147.60	0.00	25804.23	0.00	183800.70	1310526.16	-1126725.46	
105+50	13199.56	0.00	21689.82	0.00	209604.92	1310526.16	-1100921.24	
105+90.05	13395.66	0.00		0.00	231294.74	1310526.16	-1079231.42	

106+00	13356.24	0.00	5421.33	0.00	236716.07	1310526.16	-1073810.09
106+50	12622.00	0.00	26459.32	0.00	263175.39	1310526.16	-1047350.77
107+00	11042.13	0.00	24102.36	0.00	287277.74	1310526.16	-1023248.41
107+50	8783.07	0.00	20192.34	0.00	307470.08	1310526.16	-1003056.08
108+00	6194.69	0.00	15255.12	0.00	322725.21	1310526.16	-987800.95
108+50	3581.56	0.00	9957.29	0.00	332682.49	1310526.16	-977843.67
109+00	1391.08	129.64	5064.72	108.03	337747.21	1310634.19	-972886.97
109+50	256.56	800.78	1678.16	775.35	339425.37	1311409.54	-971984.17
110+00	0.00	2004.41	261.31	2337.66	339686.69	1313747.20	-974060.51
110+50	0.00	2710.56	0.00	3929.14	339686.69	1317676.34	-977989.66
111+00	0.00	2744.27	0.00	4545.69	339686.69	1322222.03	-982535.35
111+50	0.00	2350.08	0.00	4245.29	339686.69	1326467.33	-986780.64
112+00	3.53	1816.05	3.60	3471.77	339690.28	1329939.10	-990248.81
112+50	421.01	317.90	432.40	1778.29	340122.69	1331717.39	-991594.71
113+00	2632.44	0.00	3109.99	264.92	343232.67	1331982.31	-988749.64
113+50	4719.57	0.00	7488.15	0.00	350720.83	1331982.31	-981261.49
114+00	5976.07	0.00	10893.70	0.00	361614.53	1331982.31	-970367.78
114+50	5985.35	0.00	12182.92	0.00	373797.45	1331982.31	-958184.86
115+00	5026.02	0.00	11215.29	0.00	385012.74	1331982.31	-946969.58
115+50	3539.73	0.00	8724.38	0.00	393737.12	1331982.31	-938245.19
115+52.61	3457.03	0.00	371.49	0.00	394108.61	1331982.31	-937873.70
116+00	2068.20	0.00	5327.00	0.00	399435.61	1331982.31	-932546.70
116+50	763.58	1.01	2872.86	0.85	402308.47	1331983.16	-929674.69
117+00	4.05	432.37	778.94	365.33	403087.42	1332348.49	-929261.07
117+50	0.00	1090.61	4.13	1275.73	403091.54	1333624.22	-930532.68
118+00	0.00	1155.80	0.00	1871.29	403091.54	1335495.51	-932403.97
118+50	0.00	805.52	0.00	1627.69	403091.54	1337123.21	-934031.67
119+00	0.00	550.37	0.00	1122.47	403091.54	1338245.68	-935154.14
119+50	5.43	314.90	5.53	716.57	403097.07	1338962.24	-935865.18
119+52.61	6.89	301.86	0.65	26.67	403097.72	1338988.92	-935891.20
120+00	57.07	129.34	61.67	343.79	403159.40	1339332.71	-936173.31
120+50	7.84	510.12	64.96	546.84	403224.36	1339879.55	-936655.19
121+00	3.31	961.38	10.85	1264.92	403235.21	1341144.47	-937909.25
121+50	0.30	1253.85	3.47	1906.69	403238.68	1343051.15	-939812.47
122+00	0.00	1418.03	0.30	2292.09	403238.98	1345343.25	-942104.26
122+50	0.00	1380.12	0.00	2386.66	403238.98	1347729.91	-944490.92
123+00	0.00	1237.77	0.00	2222.03	403238.98	1349951.94	-946712.96
123+50	0.00	1018.91	0.00	1908.46	403238.98	1351860.40	-948621.41
124+00	0.00	713.27	0.00	1454.84	403238.98	1353315.24	-950076.26
124+50	0.00	776.40	0.00	1246.39	403238.98	1354561.63	-951322.65
125+00	0.00	1050.50	0.00	1529.74	403238.98	1356091.37	-952852.38
125+11.17	0.00	1051.46	0.00	392.76	403238.98	1356484.13	-953245.15
125+50	0.00	886.48	0.00	1258.10	403238.98	1357742.23	-954503.25
126+00	8.90	477.32	9.05	1151.77	403248.04	1358894.00	-955645.96
126+50	18.75	365.06	28.13	711.45	403276.17	1359605.45	-956329.29
127+00	8.87	433.53	28.11	670.01	403304.28	1360275.46	-956971.19
127+50	0.00	623.90	9.03	881.92	403313.30	1361157.38	-957844.08
			0.00	1187.68	403313.30	1362345.06	-959031.75

128+00	0.00	805.61	0.00	1735.86	403313.30	1364080.92	-960767.62
128+50	0.00	1283.07	0.00	2553.80	403313.30	1366634.72	-963321.42
129+00	0.00	1784.61	0.00	670.14	403313.30	1367304.86	-963991.56
129+11.17	0.00	1814.49	0.00	2397.19	403313.30	1369702.05	-966388.75
129+50	0.00	1889.96	0.00	3276.71	403313.30	1372978.77	-969665.46
130+00	0.00	2042.10	0.00	1183.37	403313.30	1374162.14	-970848.83
130+16.97	0.00	2141.00					

Segment C

Segment: C

Station	END AREA VOLUME LISTING WITH CURVE CORRECTION		Cut 1.1000		Fill 0.9000		Mass Ordinate	
	Cut Area (sqft)	Fill Area (sqft)	Volume (yds)	Volume (yds)	Tot Vol (yds)	Tot Vol (yds)		
0+00	0.00	1298.95		0.00	2311.31	0.00	2311.31	-2311.31
0+50	0.00	1474.62		0.00	2516.76	0.00	4828.07	-4828.07
1+00	0.00	1545.50		0.00	2690.86	0.00	7518.92	-7518.92
1+50	0.00	1683.53		0.00	2728.15	0.00	10247.07	-10247.07
2+00	0.00	1590.25		0.00	2467.57	0.00	12714.64	-12714.64
2+50	0.00	1370.84		0.00	1862.77	0.00	14577.41	-14577.41
3+00	0.00	864.49		77.89	980.18	77.89	15557.60	-15479.71
3+50	76.48	311.73		363.96	357.13	441.86	15914.72	-15472.87
4+00	280.87	116.82		812.32	137.10	1254.18	16051.82	-14797.65
4+50	516.68	47.70		1128.81	43.55	2382.99	16095.37	-13712.38
5+00	591.61	4.56		1171.62	14.07	3554.61	16109.44	-12554.83
5+50	558.71	12.33		1362.15	15.47	4916.76	16124.92	-11208.15
6+00	778.68	6.24		1966.94	5.20	6883.70	16130.12	-9246.41
6+50	1152.50	0.00		2443.71	0.00	9327.41	16130.12	-6802.70
7+00	1246.78	0.00		2621.32	0.00	11948.73	16130.12	-4181.39
7+50	1326.87	0.00		2849.86	0.00	14798.58	16130.12	-1331.53
8+00	1471.17	0.00		3105.28	0.00	17903.87	16130.12	1773.75
8+50	1577.65	0.00		2906.08	0.00	20809.94	16130.12	4679.83
9+00	1275.59	0.00		1944.47	0.00	22754.42	16130.12	6624.30
9+50	633.53	0.00		774.05	42.02	23528.47	16172.14	7356.33
10+00	126.44	50.43		128.79	344.61	23657.25	16516.75	7140.50
10+50	0.00	363.10		0.00	807.37	23657.25	17324.12	6333.13
11+00	0.00	605.74		0.00	871.61	23657.25	18195.73	5461.53
11+50	0.00	440.19		14.61	583.69	23671.86	18779.41	4892.44
12+00	14.34	260.24		84.68	310.10	23756.54	19089.51	4667.03
12+50	68.80	111.88		286.41	111.83	24042.95	19201.34	4841.60
13+00	212.39	22.32		710.74	18.60	24753.68	19219.94	5533.74
13+50	485.42	0.00		1262.02	0.00	26015.70	19219.94	6795.76
14+00	753.65	0.00		1577.18	0.00	27592.88	19219.94	8372.94
14+50	794.85	0.00		1470.81	0.00	29063.69	19219.94	9843.75
15+00	649.22	0.00		714.73	33.02	29778.42	19252.97	10525.46
15+50	52.52	39.63		53.49	404.51	29831.91	19657.47	10174.44
16+00	0.00	445.78		0.00	614.15	29831.91	20271.62	9560.29
16+50	0.00	291.20		24.43	436.51	29856.35	20708.14	9148.21
17+00	23.99	232.62		182.98	342.95	30039.33	21051.08	8988.25
17+50	155.67	178.92		286.44	319.02	30325.77	21370.10	8955.67
18+00	125.57	203.91		213.40	355.64	30539.17	21725.74	8813.44
18+50	83.96	222.86		137.39	381.16	30676.56	22106.90	8569.66
19+00	50.93	234.53		78.85	394.57	30755.41	22501.47	8253.94
19+50	26.48	238.95		41.52	396.73	30796.92	22898.20	7898.72
20+00	14.28	237.13		18.48	479.12	30815.41	23377.32	7438.09
20+50	3.87	337.82		4.85	640.07	30820.26	24017.39	6802.86
21+00	0.89	430.27						

21+50	0.00	545.67	0.90	813.29	30821.16	24830.68	5990.48
22+00	0.00	731.71	0.00	1064.49	30821.16	25895.17	4925.99
22+50	0.00	617.52	0.00	1124.36	30821.16	27019.52	3801.63
23+00	0.00	581.67	0.00	999.33	30821.16	28018.85	2802.31
23+50	0.00	610.39	0.00	993.38	30821.16	29012.23	1808.93
24+00	14.03	526.48	14.29	947.39	30835.45	29959.62	875.83
24+50	52.08	361.50	67.33	739.98	30902.78	30699.61	203.18
25+00	114.03	91.88	169.18	377.82	31071.97	31077.42	-5.45
25+50	300.87	0.00	422.58	76.56	31494.55	31153.99	340.56
26+00	471.09	0.00	786.26	0.00	32280.81	31153.99	1126.82
26+50	539.26	0.00	1029.07	0.00	33309.87	31153.99	2155.89
27+00	437.32	0.00	994.67	0.00	34304.55	31153.99	3150.56
27+50	340.06	43.58	791.78	36.32	35096.33	31190.31	3906.02
28+00	243.51	162.93	594.38	172.09	35690.71	31362.40	4328.31
28+50	160.64	247.57	411.63	342.08	36102.34	31704.47	4397.87
29+00	99.50	317.38	264.96	470.79	36367.30	32175.26	4192.04
29+50	81.41	348.74	184.26	555.10	36551.56	32730.36	3821.21
30+00	109.50	303.17	194.44	543.25	36746.00	33273.61	3472.39
30+50	63.86	369.84	176.56	560.84	36922.56	33834.45	3088.11
31+00	3.31	534.00	68.41	753.20	36990.97	34587.65	2403.32
31+50	11.43	623.26	15.01	964.38	37005.98	35552.03	1453.95
32+00	8.97	610.99	20.77	1028.54	37026.76	36580.58	446.18
32+50	10.36	692.74	19.69	1086.45	37046.45	37667.02	-620.58
33+00	25.20	695.02	36.22	1156.47	37082.67	38823.49	-1740.82
33+50	12.41	650.33	38.30	1121.12	37120.97	39944.61	-2823.64
34+00	0.00	724.63	12.64	1145.80	37133.61	41090.41	-3956.80
34+50	0.00	884.96	0.00	1341.33	37133.61	42431.74	-5298.13
35+00	0.00	757.12	0.00	1368.40	37133.61	43800.14	-6666.53
35+50	0.00	843.75	0.00	1334.06	37133.61	45134.20	-8000.59
36+00	0.00	1233.64	0.00	1731.16	37133.61	46865.37	-9731.76
36+50	0.00	1487.77	0.00	2267.84	37133.61	49133.20	-11999.59
37+00	0.00	1750.83	0.00	2698.83	37133.61	51832.03	-14698.42
37+50	0.00	2354.20	0.00	3420.85	37133.61	55252.89	-18119.28
38+00	0.00	2655.21	0.00	4174.50	37133.61	59427.39	-22293.78
38+50	0.00	2925.32	0.00	4650.44	37133.61	64077.83	-26944.22
39+00	0.00	3292.07	0.00	5181.16	37133.61	69258.98	-32125.37
39+50	0.00	3579.52	0.00	5726.33	37133.61	74985.31	-37851.70
40+00	0.00	3726.01	0.00	6087.94	37133.61	81073.25	-43939.64
40+50	0.00	3736.53	0.00	6218.78	37133.61	87292.04	-50158.43
41+00	0.00	3657.68	0.00	6161.84	37133.61	93453.88	-56320.27
41+50	0.00	3510.07	0.00	5973.12	37133.61	99427.00	-62293.39
42+00	0.00	3540.23	0.00	5875.25	37133.61	105302.25	-68168.64
42+50	0.00	3729.85	0.00	6058.40	37133.61	111360.65	-74227.04
43+00	0.00	3780.00	0.00	6258.21	37133.61	117618.86	-80485.25
43+50	0.00	3935.32	0.00	6429.43	37133.61	124048.29	-86914.68
44+00	0.00	3955.47	0.00	6575.66	37133.61	130623.95	-93490.34
44+50	0.00	3936.82	0.00	6576.91	37133.61	137200.86	-100067.25
			0.00	6414.93	37133.61	143615.80	-106482.19

45+00	0.00	3761.10	0.00	5992.18	37133.61	149607.98	-112474.37
45+50	0.00	3429.52	0.00	5674.13	37133.61	155282.10	-118148.49
46+00	0.00	3379.44	0.00	5565.01	37133.61	160847.11	-123713.50
46+50	0.00	3298.58	0.00	5073.12	37133.61	165920.23	-128786.62
47+00	0.00	2789.16	0.00	4487.93	37133.61	170408.16	-133274.55
47+50	0.00	2596.35	0.00	4163.46	37133.61	174571.62	-137438.01
48+00	0.00	2399.81	0.00	4076.51	37133.61	178648.13	-141514.52
48+50	0.00	2492.01	0.00	3802.90	37133.61	182451.03	-145317.42
49+00	0.00	2071.47	0.00	3169.26	37133.61	185620.29	-148486.68
49+50	0.00	1731.64	0.00	2604.99	37133.61	188225.28	-151091.67
50+00	0.00	1394.34	11.28	1993.74	37144.89	190219.02	-153074.13
50+50	11.07	998.15	106.50	1384.88	37251.39	191603.90	-154352.52
51+00	93.49	663.71	367.25	872.84	37618.64	192476.74	-154858.10
51+50	267.08	383.69	827.61	563.53	38446.25	193040.27	-154594.02
52+00	545.48	292.54	651.67	286.96	39097.91	193327.22	-154229.31
52+26.28	671.94	362.68					

Segment D1

Segment: D1

Station	END AREA		VOLUME LISTING WITH CURVE CORRECTION				Mass	Ordinate
	Cut Area (sqft)	Fill Area (sqft)	Cut 1.1000 Volume (yds)	Fill 0.9000 Volume (yds)	Cut 1.1000 Tot Vol (yds)	Fill 0.9000 Tot Vol (yds)		
0+00	862.10	831.33						
0+50	924.83	929.07	1820.02	1467.00	1820.02	1467.00	353.02	
1+00	649.99	1266.55	1603.98	1829.69	3424.01	3296.69	127.32	
1+50	190.73	1688.60	856.29	2462.63	4280.29	5759.32	-1479.02	
2+00	3.31	1947.05	197.63	3029.71	4477.92	8789.03	-4311.11	
2+34.53	0.00	1824.42	2.33	2170.50	4480.25	10959.53	-6479.28	
2+50	0.00	1682.00	0.00	903.85	4480.25	11863.38	-7383.13	
3+00	0.00	2718.25	0.00	3665.80	4480.25	15529.18	-11048.93	
3+50	0.00	3327.62	0.00	5051.65	4480.25	20580.82	-16100.58	
4+00	0.00	3022.94	0.00	5325.36	4480.25	25906.18	-21425.93	
4+50	0.00	2542.10	0.00	4681.19	4480.25	30587.37	-26107.12	
5+00	0.00	2207.99	0.00	4014.42	4480.25	34601.79	-30121.54	
5+50	7.44	2117.24	7.42	3680.47	4487.67	38282.26	-33794.59	
6+00	45.68	2239.91	51.53	3737.28	4539.20	42019.55	-37480.35	
6+34.53	124.35	2311.74	113.22	2716.47	4652.41	44736.01	-40083.60	
6+50	174.99	2232.41	89.06	1220.35	4741.47	45956.37	-41214.89	
7+00	417.11	1660.41	569.69	3391.44	5311.16	49347.81	-44036.65	
7+50	963.41	1035.49	1332.90	2357.27	6644.06	51705.08	-45061.02	
8+00	1756.16	367.96	2640.53	1229.06	9284.59	52934.15	-43649.56	
8+50	2274.78	22.52	3941.24	342.52	13225.83	53276.67	-40050.84	
9+00	2575.45	0.00	4782.69	19.28	18008.51	53295.94	-35287.43	
9+50	2653.12	0.00	5193.01	0.00	23201.52	53295.94	-30094.42	
9+68.30	2615.11	0.00	1921.95	0.00	25123.47	53295.94	-28172.47	
10+00	2592.02	0.00	3429.40	0.00	28552.88	53295.94	-24743.07	
10+50	2752.67	0.00	5539.03	0.00	34091.91	53295.94	-19204.04	
11+00	3102.95	0.00	6048.65	0.00	40140.56	53295.94	-13155.38	
11+50	3350.50	0.00	6644.60	0.00	46785.16	53295.94	-6510.79	
12+00	3504.16	0.00	7041.50	0.00	53826.66	53295.94	530.72	
12+50	3514.61	0.00	7196.19	0.00	61022.85	53295.94	7726.91	
13+00	3515.72	0.00	7193.70	0.00	68216.56	53295.94	14920.61	
13+50	3787.44	0.00	7455.85	0.00	75672.41	53295.94	22376.46	
13+68.30	3956.34	0.00	2888.56	0.00	78560.96	53295.94	25265.02	
14+00	4196.49	0.00	5264.29	0.00	83825.26	53295.94	30529.31	
14+50	4156.97	0.00	8508.15	0.00	92333.40	53295.94	39037.46	
15+00	3959.73	0.00	8267.01	0.00	100600.42	53295.94	47304.47	
15+50	3146.90	58.02	7238.24	48.35	107838.66	53344.29	54494.36	
16+00	1735.78	345.54	4973.10	336.30	112811.75	53680.59	59131.16	
16+50	689.45	739.37	2470.14	904.09	115281.90	54584.69	60697.21	
17+00	49.34	1450.49	752.47	1824.88	116034.37	56409.57	59624.80	
17+50	0.00	2601.70	50.25	3376.82	116084.62	59786.39	56298.23	
18+00	0.00	3755.05	0.00	5297.29	116084.62	65083.68	51000.94	
18+50	0.00	4987.82	0.00	7285.73	116084.62	72369.41	43715.22	
19+00	0.00	6511.29	0.00	9582.60	116084.62	81952.00	34132.62	
19+50	0.00	7271.27	0.00	11485.47	116084.62	93437.47	22647.15	

20+00	0.00	7694.68	0.00	12471.62	116084.62	105909.10	10175.52
20+50	0.00	7722.82	0.00	12847.91	116084.62	118757.01	-2672.39
21+00	0.00	7273.02	0.00	12496.53	116084.62	131253.54	-15168.92
21+50	0.00	5524.51	0.00	10664.61	116084.62	141918.16	-25833.53
21+67.84	0.00	4670.69	0.00	3030.98	116084.62	144949.13	-28864.51
22+00	0.00	2984.91	0.00	4100.74	116084.62	149049.87	-32965.24
22+50	0.00	2055.62	0.00	4198.03	116084.62	153247.89	-37163.27
23+00	0.00	2962.65	0.00	4196.40	116084.62	157444.29	-41359.67
23+50	0.00	2288.91	0.00	4404.65	116084.62	161848.94	-45764.31
24+00	0.00	1200.95	0.00	2937.70	116084.62	164786.64	-48702.02
24+50	89.99	250.95	90.93	1232.75	116175.55	166019.39	-49843.84
25+00	823.26	0.00	917.56	212.21	117093.11	166231.59	-49138.48
25+50	2014.44	0.00	2870.39	0.00	119963.51	166231.59	-46268.09
25+67.84	2520.21	0.00	1640.73	0.00	121604.23	166231.59	-44627.36
26+00	3516.28	0.00	3942.48	0.00	125546.72	166231.59	-40684.88
26+50	5264.86	0.00	8929.24	0.00	134475.95	166231.59	-31755.64
27+00	7125.18	0.00	12610.45	0.00	147086.40	166231.59	-19145.19
27+50	8389.10	0.00	15778.18	0.00	162864.58	166231.59	-3367.01
28+00	9615.08	0.00	18270.09	0.00	181134.68	166231.59	14903.08
28+50	9941.81	0.00	19760.94	0.00	200895.62	166231.59	34664.02
29+00	9984.39	0.00	20053.54	0.00	220949.15	166231.59	54717.56
29+50	9980.16	0.00	20034.51	0.00	240983.67	166231.59	74752.07
30+00	9799.11	0.00	19794.86	0.00	260778.53	166231.59	94546.94
30+50	9627.84	0.00	19415.16	0.00	280193.69	166231.59	113962.10
31+00	9533.16	0.00	19140.30	0.00	299333.98	166231.59	133102.39
31+50	9508.05	0.00	19036.89	0.00	318370.87	166231.59	152139.28
32+00	9485.56	0.00	19032.98	0.00	337403.85	166231.59	171172.26
32+50	9336.34	0.00	18946.95	0.00	356350.80	166231.59	190119.21
33+00	8388.00	0.00	17939.74	0.00	374290.54	166231.59	208058.95
33+50	6760.40	0.00	15392.61	0.00	389683.16	166231.59	223451.57
34+00	4834.12	0.00	11821.44	0.00	401504.59	166231.59	235273.00
34+50	1927.33	0.00	6881.20	0.00	408385.80	166231.59	242154.21
35+00	103.83	293.43	2032.09	249.29	410417.89	166480.88	243937.01
35+50	0.00	2191.00	104.11	2124.41	410522.00	168605.29	241916.71
36+00	0.00	3594.31	0.00	4865.56	410522.00	173470.85	237051.15
36+50	0.00	3885.82	0.00	6230.44	410522.00	179701.29	230820.71
37+00	0.00	3693.09	0.00	6263.25	410522.00	185964.54	224557.46
37+50	0.00	3349.09	0.00	5798.89	410522.00	191763.43	218758.57
38+00	0.00	2397.73	0.00	4716.16	410522.00	196479.59	214042.41
38+50	0.00	1836.37	0.00	3461.66	410522.00	199941.26	210580.74
39+00	8.01	1267.17	8.38	2515.99	410530.38	202457.24	208073.14
39+16.62	123.24	931.71	46.78	584.91	410577.16	203042.15	207535.01
39+50	731.56	719.46	555.61	960.14	411132.77	204002.29	207130.48
40+00	1242.37	486.06	1935.90	1046.51	413068.67	205048.80	208019.87
40+50	1683.13	403.25	2879.87	768.09	415948.54	205816.89	210131.64
41+00	2384.17	263.13	4021.17	572.73	419969.71	206389.62	213580.08
41+50	3355.86	126.99	5696.46	333.45	425666.16	206723.07	218943.09
			7442.91	144.71	433109.08	206867.78	226241.29

42+00	4104.83	43.37						
42+50	4120.81	37.03	8270.45	67.86	441379.53	206935.64	234443.89	
43+00	3686.02	69.82	7908.70	89.56	449288.23	207025.19	242263.03	
43+16.62	3487.22	83.16	2426.59	42.43	451714.82	207067.63	244647.19	
43+50	3129.49	107.08	4498.61	105.83	456213.43	207173.45	249039.97	
44+00	2680.46	123.78	5917.54	192.39	462130.97	207365.85	254765.12	
44+50	2302.42	124.76	5075.15	207.12	467206.12	207572.97	259633.15	
45+00	1807.53	217.65	4186.06	285.34	471392.18	207858.31	263533.87	
45+50	1325.70	299.09	3191.25	430.61	474583.43	208288.92	266294.51	
46+00	1063.62	260.77	2433.56	466.55	477016.99	208755.47	268261.52	
46+50	960.54	249.75	2061.64	425.43	479078.63	209180.91	269897.73	
47+00	833.76	363.07	1827.53	510.69	480906.16	209691.59	271214.57	
47+13.82	801.15	400.93	460.42	176.04	481366.57	209867.63	271498.95	
47+50	723.40	542.00	1121.43	569.77	482488.00	210437.40	272050.61	
48+00	450.15	868.21	1187.36	1183.85	483675.36	211621.25	272054.11	
48+50	162.29	1319.38	615.15	1845.76	484290.51	213467.01	270823.50	
49+00	33.33	1946.10	194.91	2765.84	484485.43	216232.85	268252.58	
49+50	0.00	2462.52	33.45	3743.65	484518.88	219976.50	264542.38	
50+00	0.00	2351.08	0.00	4091.65	484518.88	224068.15	260450.74	
50+50	0.00	2239.02	0.00	3907.63	484518.88	227975.78	256543.10	
51+00	0.00	3097.33	0.00	4549.54	484518.88	232525.32	251993.56	
51+13.82	0.00	3346.75	0.00	1518.87	484518.88	234044.19	250474.69	
51+50	0.00	3929.90	0.00	4483.23	484518.88	238527.42	245991.46	
52+00	0.00	4510.95	0.00	7168.24	484518.88	245695.66	238823.22	
52+50	0.00	4876.60	0.00	7957.09	484518.88	253652.76	230866.13	
53+00	0.00	5201.71	0.00	8552.50	484518.88	262205.25	222313.63	
53+50	0.00	5382.70	0.00	9004.39	484518.88	271209.64	213309.24	
54+00	0.00	5094.20	0.00	8915.87	484518.88	280125.51	204393.38	
54+50	0.00	4455.77	0.00	8108.16	484518.88	288233.67	196285.21	
55+00	0.00	3917.37	0.00	7079.75	484518.88	295313.42	189205.47	
55+50	0.00	3988.41	0.00	6654.95	484518.88	301968.37	182550.52	
56+00	0.00	4351.46	0.00	6998.51	484518.88	308966.88	175552.01	
56+50	0.00	5102.72	0.00	7917.22	484518.88	316884.10	167634.79	
57+00	0.00	5982.04	0.00	9273.28	484518.88	326157.38	158361.51	
57+50	0.00	6654.38	0.00	10576.83	484518.88	336734.20	147784.68	
58+00	0.00	6289.87	0.00	10843.58	484518.88	347577.78	136941.10	
58+50	0.00	5766.39	0.00	10104.97	484518.88	357682.75	126836.13	
58+64.81	0.00	5606.14	0.00	2824.78	484518.88	360507.53	124011.35	
59+00	0.00	5324.55	0.00	6362.45	484518.88	366869.98	117648.90	
59+50	0.00	5147.81	0.00	8643.54	484518.88	375513.52	109005.36	
60+00	0.00	4945.46	0.00	8319.81	484518.88	383833.33	100685.55	
60+50	0.00	4576.75	0.00	7843.90	484518.88	391677.23	92841.65	
61+00	0.00	3797.87	0.00	6906.30	484518.88	398583.53	85935.35	
61+50	0.00	3431.00	0.00	5987.24	484518.88	404570.78	79948.11	
62+00	0.00	3622.20	0.00	5864.48	484518.88	410435.25	74083.63	
62+50	0.00	3700.58	0.00	6097.97	484518.88	416533.23	67985.66	
62+64.81	0.00	3689.41	0.00	1823.67	484518.88	418356.90	66161.98	
63+00	0.00	3645.75	0.00	4302.25	484518.88	422659.15	61859.73	

63+50	0.00	3516.25	0.00	5968.34	484518.88	428627.49	55891.39
64+00	0.00	3413.39	0.00	5774.71	484518.88	434402.19	50116.69
64+50	0.00	3426.54	0.00	5699.95	484518.88	440102.14	44416.74
65+00	0.00	3316.08	0.00	5618.85	484518.88	445721.00	38797.89
65+50	0.00	3438.31	0.00	5628.66	484518.88	451349.65	33169.23
66+00	0.00	3980.30	0.00	6182.17	484518.88	457531.83	26987.06
66+50	0.00	4845.98	0.00	7355.23	484518.88	464887.05	19631.83
67+00	0.00	5685.25	0.00	8776.02	484518.88	473663.07	10855.81
67+50	0.00	6116.36	0.00	9834.67	484518.88	483497.75	1021.14
68+00	0.00	6032.16	0.00	10123.77	484518.88	493621.52	-9102.63
68+18.92	0.00	5815.07	0.00	3736.27	484518.88	497357.78	-12838.90
68+50	0.00	5292.18	0.00	5751.97	484518.88	503109.75	-18590.87
69+00	0.00	3972.94	0.00	7715.35	484518.88	510825.10	-26306.22
69+50	0.00	2617.27	0.00	5483.28	484518.88	516308.38	-31789.50
70+00	0.00	1611.08	0.00	3513.64	484518.88	519822.02	-35303.14
70+50	135.30	981.90	138.27	2150.30	484657.15	521972.32	-37315.17
71+00	120.97	669.23	263.11	1366.13	484920.26	523338.45	-38418.19
71+50	50.65	958.02	176.52	1344.79	485096.78	524683.24	-39586.46
72+00	0.00	1581.96	51.90	2099.98	485148.68	526783.23	-41634.54
72+18.92	0.00	1956.64	0.00	1108.41	485148.68	527891.63	-42742.95
72+50	0.00	2658.25	0.00	2376.57	485148.68	530268.20	-45119.52
73+00	0.00	3811.99	0.00	5366.82	485148.68	535635.02	-50486.34
73+50	0.00	4754.13	0.00	7111.58	485148.68	542746.60	-57597.92
74+00	0.00	5332.58	0.00	8379.14	485148.68	551125.74	-65977.05
74+50	0.00	5726.32	0.00	9189.35	485148.68	560315.09	-75166.40
75+00	0.00	6096.18	0.00	9821.11	485148.68	570136.20	-84987.51
75+50	0.00	6245.75	0.00	10243.43	485148.68	580379.63	-95230.94
76+00	0.00	6104.92	0.00	10240.39	485148.68	590620.02	-105471.34
76+50	0.00	5630.16	0.00	9722.10	485148.68	600342.12	-115193.44
77+00	0.00	4696.38	0.00	8546.95	485148.68	608889.07	-123740.39
77+50	0.00	3554.80	0.00	6824.62	485148.68	615713.69	-130565.01
78+00	0.00	2331.57	0.00	4865.99	485148.68	620579.69	-135431.00
78+50	141.89	1130.41	145.50	2857.49	485294.18	623437.18	-138143.00
79+00	743.27	402.75	912.39	1263.38	486206.57	624700.56	-138493.99
79+50	1512.13	39.78	2318.83	364.11	488525.40	625064.67	-136539.27
80+00	2322.27	0.00	3933.68	32.92	492459.08	625097.60	-132638.51
80+50	2915.43	0.00	5363.39	0.00	497822.47	625097.60	-127275.13
81+00	3112.59	0.00	6163.81	0.00	503986.28	625097.60	-121111.32
81+43.42	2924.58	0.00	5353.96	0.00	509340.24	625097.60	-115757.36
81+50	2860.31	0.00	774.14	0.00	510114.38	625097.60	-114983.21
82+00	2216.30	0.00	5163.18	0.00	515277.56	625097.60	-109820.04
82+50	1527.45	0.00	3813.37	0.00	519090.93	625097.60	-106006.67
83+00	926.75	0.00	2503.00	0.00	521593.93	625097.60	-103503.67
83+50	402.25	7.68	1356.17	6.38	522950.10	625103.97	-102153.88
84+00	187.40	140.27	601.36	122.67	523551.45	625226.65	-101675.19
84+50	91.45	196.72	284.19	279.95	523835.64	625506.60	-101670.96
85+00	46.66	243.16	140.71	365.99	523976.35	625872.59	-101896.24
			43.67	430.75	524020.01	626303.34	-102283.32

85+43.42	2.71	352.31	0.99	73.94	524021.01	626377.27	-102356.27
85+50	4.68	321.45	118.70	291.33	524139.70	626668.60	-102528.90
86+00	111.86	28.15	730.11	23.46	524869.81	626692.06	-101822.25
86+50	604.98	0.00	1771.28	0.00	526641.09	626692.06	-100050.97
87+00	1134.10	0.00	2389.18	0.00	529030.27	626692.06	-97661.79
87+50	1211.65	0.00	2234.67	0.00	531264.94	626692.06	-95427.12
88+00	982.39	0.00	1544.21	0.00	532809.15	626692.06	-93882.91
88+50	533.74	0.00	591.10	267.35	533400.25	626959.41	-93559.16
89+00	46.61	320.82	24.89	467.22	533425.14	627426.62	-94001.48
89+26.22	0.00	748.50	0.00	783.19	533425.14	628209.81	-94784.67
89+50	0.00	1226.31	0.00	2803.08	533425.14	631012.89	-97587.75
90+00	0.00	2132.36	0.00	4087.80	533425.14	635100.69	-101675.55
90+50	0.00	2760.08	0.00	4776.25	533425.14	639876.94	-106451.80
91+00	0.00	2955.12	0.00	5418.84	533425.14	645295.78	-111870.64
91+50	0.00	3534.64	0.00	6152.33	533425.14	651448.11	-118022.97
92+00	0.00	3844.36	0.00	6269.69	533425.14	657717.80	-124292.66
92+50	0.00	3686.93	0.00	5709.18	533425.14	663426.97	-130001.83
93+00	0.00	3195.85	0.00	2645.13	533425.14	666072.11	-132646.97
93+26.22	0.00	2920.60	0.00	2202.95	533425.14	668275.06	-134849.92
93+50	0.00	2718.85	0.00	4230.38	533425.14	672505.44	-139080.30
94+00	0.00	2446.08	0.00	3788.01	533425.14	676293.45	-142868.31
94+50	0.00	2184.60	0.00	3308.47	533425.14	679601.91	-146176.77
95+00	0.00	1867.54	0.00	3037.58	533425.14	682639.49	-149214.35
95+50	0.00	1857.38	0.00	3110.40	533425.14	685749.90	-152324.76
96+00	0.00	1956.75	0.00	3008.39	533425.14	688758.28	-155333.14
96+50	0.00	1737.71	0.00	2601.40	533425.14	691359.68	-157934.54
97+00	0.00	1455.89	0.00	2185.40	533425.14	693545.08	-160119.94
97+50	0.00	1225.57	0.00	1835.40	533425.14	695380.48	-161955.34
98+00	0.00	1024.09	0.00	1525.42	533425.14	696905.90	-163480.76
98+50	0.00	836.11	0.00	1335.85	533425.14	698241.75	-164816.61
99+00	0.00	786.14	0.00	1268.62	533425.14	699510.38	-166085.24
99+50	0.00	751.25	0.00	1237.64	533425.14	700748.02	-167322.88
100+00	0.00	745.67	0.00	1342.92	533425.14	702090.94	-168665.79
100+50	0.00	871.85	0.00	1600.77	533425.14	703691.70	-170266.56
101+00	0.00	1046.87	0.00	2027.38	533425.14	705719.08	-172293.94
101+50	0.00	1378.48	0.00	19.28	533425.14	705738.36	-172313.22
101+50.42	0.00	1381.28	0.00	2594.90	533425.14	708333.27	-174908.13
102+00	0.00	1767.15	0.00	3317.09	533425.14	711650.36	-178225.22
102+50	0.00	2213.85	0.00	4087.68	533425.14	715738.04	-182312.90
103+00	0.00	2681.65	0.00	5028.49	533425.14	720766.54	-187341.39
103+50	0.00	3337.92	0.00	6170.77	533425.14	726937.30	-193512.16
104+00	0.00	4051.57	0.00	7151.85	533425.14	734089.15	-200664.01
104+50	0.00	4520.43	0.00	7813.68	533425.14	741902.84	-208477.69
105+00	0.00	4850.96	0.00	8113.89	533425.14	750016.72	-216591.58
105+50	0.00	4883.99	0.00	68.03	533425.14	750084.75	-216659.61
105+50.42	0.00	4884.27	0.00	8018.52	533425.14	758103.28	-224678.14
106+00	0.00	4819.05	0.00	7832.42	533425.14	765935.69	-232510.55
106+50	0.00	4579.85					

107+00	0.00	4374.10	0.00	7461.63	533425.14	773397.32	-239972.18
107+50	0.00	4328.27	0.00	7251.97	533425.14	780649.29	-247224.15
108+00	0.00	4335.60	0.00	7219.89	533425.14	787869.18	-254444.04
108+50	0.00	4343.27	0.00	7232.39	533425.14	795101.57	-261676.43
109+00	0.00	4574.94	0.00	7431.84	533425.14	802533.41	-269108.27
109+50	0.00	5047.30	0.00	8018.54	533425.14	810551.95	-277126.81
110+00	0.00	5346.76	0.00	8661.71	533425.14	819213.67	-285788.52
110+50	0.00	5423.18	0.00	8974.94	533425.14	828188.61	-294763.47
110+75.59	0.00	5442.46	0.00	4634.41	533425.14	832823.02	-299397.87
111+00	0.00	5580.73	0.00	4485.34	533425.14	837308.35	-303883.21
111+50	0.00	5830.23	0.00	9518.75	533425.14	846827.11	-313401.97
112+00	0.00	5891.94	0.00	9792.34	533425.14	856619.45	-323194.31
112+50	0.00	5879.78	0.00	9849.90	533425.14	866469.35	-333044.21
113+00	0.00	5538.58	0.00	9571.02	533425.14	876040.37	-342615.23
113+50	0.00	4994.13	0.00	8852.04	533425.14	884892.41	-351467.27
114+00	0.00	4726.89	0.00	8201.70	533425.14	893094.11	-359668.97
114+50	0.00	4488.25	0.00	7797.18	533425.14	900891.29	-367466.15
114+75.59	0.00	4525.51	0.00	3909.35	533425.14	904800.64	-371375.50
115+00	0.00	4870.87	0.00	3891.86	533425.14	908692.49	-375267.35
115+50	0.00	5763.13	0.00	9036.13	533425.14	917728.62	-384303.48
116+00	0.00	6048.15	0.00	10034.33	533425.14	927762.95	-394337.81
116+50	0.00	6366.04	0.00	10510.68	533425.14	938273.63	-404848.49
117+00	0.00	6904.27	0.00	11202.77	533425.14	949476.40	-416051.26
117+50	0.00	7571.73	0.00	12187.42	533425.14	961663.82	-428238.68
118+00	0.00	8073.76	0.00	13122.43	533425.14	974786.24	-441361.10
118+50	0.00	8342.15	0.00	13720.77	533425.14	988507.01	-455081.87
119+00	0.00	8192.44	0.00	13772.17	533425.14	1002279.18	-468854.04
119+50	0.00	7641.27	0.00	13147.06	533425.14	1015426.24	-482001.10
120+00	0.00	7012.12	0.00	12154.34	533425.14	1027580.58	-494155.44
120+50	0.00	6717.13	0.00	11370.13	533425.14	1038950.71	-505525.57
120+78.79	0.00	6546.08	0.00	6308.32	533425.14	1045259.03	-511833.89
121+00	0.00	6401.29	0.00	4621.73	533425.14	1049880.76	-516455.62
121+50	0.00	6007.52	0.00	10441.91	533425.14	1060322.67	-526897.53
122+00	0.00	5942.86	0.00	10059.44	533425.14	1070382.11	-536956.97
122+50	0.00	5852.69	0.00	9932.22	533425.14	1080314.32	-546889.18
123+00	0.00	5635.47	0.00	9667.55	533425.14	1089981.87	-556556.73
123+50	0.00	5465.19	0.00	9324.98	533425.14	1099306.85	-565881.71
124+00	0.00	5387.58	0.00	9093.03	533425.14	1108399.89	-574974.75
124+50	0.00	5096.56	0.00	8762.20	533425.14	1117162.09	-583736.95
124+78.79	0.00	4906.04	0.00	4803.24	533425.14	1121965.33	-588540.19
125+00	0.00	4653.77	0.00	3379.68	533425.14	1125345.01	-591919.87
125+50	0.00	3986.40	0.00	7200.14	533425.14	1132545.15	-599120.01
126+00	0.00	3266.74	0.00	6044.28	533425.14	1138589.43	-605164.29
126+50	0.00	2610.46	0.00	4897.67	533425.14	1143487.09	-610061.95
127+00	0.00	2072.61	0.00	3902.56	533425.14	1147389.65	-613964.51
127+50	0.00	1345.60	0.00	2848.50	533425.14	1150238.15	-616813.01
127+80.02	0.00	864.53	0.00	1105.68	533425.14	1151343.83	-617918.69

Segment D2

Segment: D2

Station	END AREA VOLUME LISTING WITH CURVE CORRECTION		Cut 1.1000		Fill 0.9000		Mass Ordinate
	Cut Area (sqft)	Fill Area (sqft)	Cut Volume (yds)	Fill Volume (yds)	Cut Tot Vol (yds)	Fill Tot Vol (yds)	
0+00	1019.36	714.48					
0+50	1170.52	780.46	2230.43	1245.78	2230.43	1245.78	984.65
1+00	887.79	1022.00	2096.43	1502.05	4326.86	2747.84	1579.03
1+50	377.91	1339.21	1289.14	1967.68	5616.01	4715.51	900.49
2+00	62.26	1481.97	448.33	2350.99	6064.33	7066.50	-1002.17
2+50	46.88	1122.85	111.17	2170.69	6175.50	9237.19	-3061.69
2+51.76	45.05	1104.94	3.30	65.39	6178.80	9302.58	-3123.78
3+00	0.00	1929.52	44.24	2439.92	6223.03	11742.50	-5519.47
3+50	0.00	2338.00	0.00	3552.47	6223.03	15294.96	-9071.93
4+00	0.00	1922.15	0.00	3540.07	6223.03	18835.03	-12612.00
4+50	25.94	1398.03	26.56	2753.89	6249.59	21588.92	-15339.34
5+00	124.54	1029.02	155.30	2007.30	6404.89	23596.22	-17191.33
5+50	255.26	1048.56	393.03	1712.32	6797.92	25308.54	-18510.63
6+00	326.32	1235.97	603.71	1877.98	7401.62	27186.52	-19784.90
6+50	466.98	1487.04	826.53	2233.03	8228.15	29419.55	-21191.40
6+51.76	472.83	1490.24	34.56	85.88	8262.71	29505.43	-21242.72
6+70.49	536.03	1499.96	394.41	916.62	8657.12	30422.05	-21764.93
7+00	652.88	1488.74	697.49	1496.63	9354.61	31918.68	-22564.07
7+50	964.84	1345.55	1611.41	2402.27	10966.02	34320.95	-23354.93
8+00	1330.80	1132.40	2294.79	2096.43	13260.81	36417.38	-23156.57
8+50	1519.40	818.96	2861.59	1647.50	16122.40	38064.88	-21942.48
9+00	1615.94	495.85	3160.76	1107.29	19283.16	39172.17	-19889.01
9+50	1696.46	268.20	3350.66	641.68	22633.82	39813.85	-17180.03
10+00	1598.86	115.57	3343.22	321.48	25977.04	40135.33	-14158.29
10+50	1175.70	57.65	2820.97	144.71	28798.02	40280.05	-11482.03
10+70.49	990.85	138.60	903.74	67.04	29701.76	40347.09	-10645.33
11+00	744.70	292.01	1043.44	211.82	30745.19	40558.90	-9813.71
11+50	358.46	531.11	1123.59	685.93	31868.78	41244.83	-9376.05
12+00	119.94	958.47	487.25	1241.32	32356.03	42486.15	-10130.11
12+50	14.56	1453.25	136.99	2009.76	32493.03	44495.91	-12002.88
13+00	0.00	1989.68	14.83	2869.10	32507.86	47365.02	-14857.15
13+50	0.00	2572.90	0.00	3802.14	32507.86	51167.16	-18659.30
14+00	0.00	2977.49	0.00	4625.32	32507.86	55792.48	-23284.62
14+50	0.00	3223.32	0.00	5167.34	32507.86	60959.82	-28451.96
15+00	0.00	3357.68	0.00	5484.17	32507.86	66443.99	-33936.12
15+50	0.00	3471.87	0.00	5691.30	32507.86	72135.28	-39627.42
16+00	0.00	3642.57	0.00	5928.71	32507.86	78063.99	-45556.13
16+50	0.00	3528.49	0.00	5975.88	32507.86	84039.87	-51532.01
17+00	0.00	3252.63	0.00	5650.93	32507.86	89690.80	-57182.94
17+50	0.00	2792.76	0.00	5037.82	32507.86	94728.62	-62220.76
18+00	0.00	2193.49	0.00	4155.20	32507.86	98883.82	-66375.96
18+50	0.00	1845.07	0.00	3365.46	32507.86	102249.29	-69741.43
19+00	0.00	1764.22	0.00	3007.74	32507.86	105257.03	-72749.17

19+32.51	0.00	1868.81	0.00	1968.65	32507.86	107225.68	-74717.82
19+50	0.00	1967.55	0.00	1118.43	32507.86	108344.12	-75836.25
20+00	4.40	2308.00	4.47	3568.32	32512.34	111912.44	-79400.10
20+50	6.80	2396.17	11.34	3934.18	32523.68	115846.62	-83322.94
21+00	11.96	2366.53	18.95	3990.67	32542.63	119837.29	-87294.66
21+50	24.94	2141.99	37.15	3785.07	32579.78	123622.36	-91042.58
22+00	44.77	1743.94	69.97	3268.09	32649.75	126890.45	-94240.69
22+50	43.33	1284.66	88.15	2550.19	32737.91	129440.64	-96702.73
23+00	120.84	1036.37	163.83	1958.98	32901.73	131399.61	-98497.88
23+32.51	226.91	956.40	225.28	1097.64	33127.02	132497.25	-99370.24
23+50	305.17	915.81	185.36	555.93	33312.38	133053.18	-99740.81
24+00	655.83	753.84	959.06	1419.08	34271.44	134472.27	-100200.83
24+50	1344.44	361.89	1998.71	949.00	36270.15	135421.26	-99151.12
25+00	2457.29	25.04	3800.18	329.59	40070.33	135750.85	-95680.52
25+50	3904.62	0.00	6370.23	21.11	46440.56	135771.96	-89331.40
26+00	4822.03	0.00	8739.62	0.00	55180.18	135771.96	-80591.78
26+50	5163.50	0.00	9985.06	0.00	65165.25	135771.96	-70606.71
26+54.52	5170.93	0.00	933.30	0.00	66098.54	135771.96	-69673.42
27+00	5360.85	0.00	9934.94	0.00	76033.48	135771.96	-59738.48
27+50	5429.80	0.86	11175.42	0.71	87208.90	135772.67	-48563.77
28+00	4601.65	451.84	10385.00	370.76	97593.90	136143.43	-38549.53
28+50	3628.84	979.51	8514.83	1176.77	106108.73	137320.21	-31211.48
29+00	2812.77	1376.64	6649.62	1944.39	112758.35	139264.60	-26506.25
29+50	1965.00	2034.41	4915.84	2823.99	117674.19	142088.59	-24414.40
30+00	843.88	2857.54	2877.84	4061.75	120552.03	146150.34	-25598.31
30+50	237.32	3427.45	1103.36	5230.92	121655.40	151381.27	-29725.87
30+54.52	202.47	3430.59	40.49	516.48	121695.89	151897.75	-30201.86
31+00	0.00	3016.66	187.58	4887.12	121883.47	156784.87	-34901.40
31+50	0.00	2194.33	0.00	4342.49	121883.47	161127.36	-39243.89
32+00	0.00	1852.21	0.00	3372.12	121883.47	164499.47	-42616.01
32+50	0.00	1690.88	0.00	2952.57	121883.47	167452.05	-45568.58
33+00	0.00	1297.30	0.00	2490.15	121883.47	169942.20	-48058.73
33+50	0.00	1579.32	0.00	2397.19	121883.47	172339.39	-50455.92
34+00	0.00	2019.06	0.00	2998.65	121883.47	175338.04	-53454.58
34+50	0.00	2529.69	0.00	3790.62	121883.47	179128.67	-57245.20
35+00	0.00	2907.06	0.00	4530.62	121883.47	183659.29	-61775.83
35+50	0.00	3003.56	0.00	4925.52	121883.47	188584.81	-66701.34
36+00	0.00	2781.24	0.00	4820.67	121883.47	193405.47	-71522.01
36+50	0.00	2106.84	0.00	4073.40	121883.47	197478.87	-75595.41
37+00	212.23	1512.35	216.16	3015.99	122099.63	200494.87	-78395.24

			904.98	2034.96	123004.61	202529.83	-79525.22
37+50	676.29	929.60	1637.57	1187.53	124642.18	203717.36	-79075.18
38+00	931.50	495.43	2012.83	846.46	126655.01	204563.82	-77908.81
38+50	1044.73	520.32	2341.37	707.88	128996.38	205271.69	-76275.31
39+00	1254.08	329.13	2830.77	328.36	131827.15	205600.06	-73772.91
39+50	1525.22	64.90	3181.54	54.79	135008.69	205654.85	-70646.16
40+00	1598.47	0.85	3423.82	18.25	138432.50	205673.10	-67240.60
40+50	1763.10	21.06	3644.03	17.55	142076.53	205690.64	-63614.11
41+00	1814.68	0.00	3688.50	0.00	145765.03	205690.64	-59925.61
41+50	1806.76	0.00	1496.63	0.00	147261.66	205690.64	-58428.98
41+69.77	1909.15	0.00	2523.68	0.00	149785.34	205690.64	-55905.30
42+00	2186.84	0.00	4787.03	0.00	154572.37	205690.64	-51118.27
42+50	2502.43	0.00	5746.52	0.00	160318.89	205690.64	-45371.76
43+00	3113.17	0.00	7196.20	0.00	167515.09	205690.64	-38175.55
43+50	3903.07	0.00	7905.77	0.00	175420.85	205690.64	-30269.79
44+00	3790.18	0.00	7960.65	0.00	183381.51	205690.64	-22309.13
44+50	3938.31	0.00	8374.10	0.00	191755.61	205690.64	-13935.03
45+00	4171.93	0.00	7848.63	0.00	199604.24	205690.64	-6086.40
45+50	3408.34	0.00	2670.23	0.00	202274.46	205690.64	-3416.18
45+69.77	3100.04	0.00	3577.76	0.00	205852.22	205690.64	161.58
46+00	2598.17	0.00	4868.36	0.75	210720.58	205691.40	5029.18
46+50	2081.54	0.91	4027.14	0.90	214747.72	205692.30	9055.43
47+00	1784.51	0.19	3331.51	0.15	218079.24	205692.45	12386.78
47+50	1415.78	0.00	2895.74	0.00	220974.97	205692.45	15282.52
48+00	1370.45	0.00	2719.28	0.00	223694.26	205692.45	18001.81
48+50	1250.63	0.00	2089.52	0.00	225783.77	205692.45	20091.32
49+00	772.39	0.00	1532.05	0.00	227315.82	205692.45	21623.37
49+48.92	749.56	0.00	32.80	0.00	227348.62	205692.45	21656.17
49+50	751.17	0.00	1592.66	0.00	228941.28	205692.45	23248.82
50+00	825.26	0.00	1894.15	0.00	230835.42	205692.45	25142.97
50+50	1044.81	0.00	2551.29	0.00	233386.71	205692.45	27694.26
51+00	1473.19	0.00	2933.29	0.00	236320.00	205692.45	30627.54
51+50	1417.36	0.00	2972.86	0.00	239292.85	205692.45	33600.40
52+00	1505.43	0.00	3232.56	0.00	242525.41	205692.45	36832.96
52+50	1669.58	0.00	3704.56	0.00	246229.97	205692.45	40537.52
53+00	1968.11	0.00	4173.24	0.00	250403.21	205692.45	44710.76
53+48.92	2220.27	0.00	98.11	0.00	250501.32	205692.45	44808.87
53+50	2224.79	0.00	4793.04	0.00	255294.36	205692.45	49601.91
54+00	2481.11	0.00	5347.50	0.00	260641.86	205692.45	54949.41
54+50	2769.16	0.00	5934.94	0.00	266576.80	205692.45	60884.35
55+00	3057.87	0.00	6452.88	0.00	273029.69	205692.45	67337.24
55+50	3277.69	0.00	6801.49	0.00	279831.17	205692.45	74138.72
56+00	3400.13	0.00	6805.83	0.00	286637.01	205692.45	80944.56
56+50	3281.96	0.00	6260.12	0.00	292897.13	205692.45	87204.67
57+00	2864.34	0.00	5977.39	0.00	298874.52	205692.45	93182.07
57+50	3004.37	0.00	5871.32	0.00	304745.84	205692.45	99053.39
58+00	2760.20	0.00	5181.94	79.89	309927.78	205772.34	104155.44
58+50	2327.52	95.87					

59+00	2140.05	246.33	4550.31	285.16	314478.09	206057.50	108420.59
59+50	1957.98	435.38	4173.93	568.09	318652.02	206625.59	112026.42
60+00	1548.37	606.01	3571.29	867.82	322223.31	207493.42	114729.89
60+50	1260.84	700.70	2861.23	1088.92	325084.54	208582.34	116502.19
61+00	1046.87	852.48	2350.44	1294.31	327434.98	209876.66	117558.32
61+50	318.77	1115.17	1390.92	1639.71	328825.90	211516.36	117309.54
61+70.82	92.03	1172.77	174.21	793.87	329000.12	212310.23	116689.88
62+00	0.00	1238.16	54.68	1172.88	329054.80	213483.11	115571.69
62+50	0.00	1170.90	0.00	2008.79	329054.80	215491.90	113562.89
63+00	0.00	1081.55	0.00	1878.37	329054.80	217370.28	111684.52
63+50	0.00	949.58	0.00	1693.37	329054.80	219063.64	109991.15
64+00	0.00	781.99	0.00	1443.20	329054.80	220506.84	108547.95
64+50	0.00	633.73	0.00	1179.87	329054.80	221686.72	107368.08
65+00	0.00	485.67	0.00	933.20	329054.80	222619.92	106434.88
65+50	2.07	385.56	2.10	726.62	329056.90	223346.54	105710.36
65+70.82	4.14	363.71	2.63	260.11	329059.53	223606.65	105452.88
66+00	7.75	321.81	7.07	333.43	329066.60	223940.08	105126.52
66+50	14.63	263.28	22.79	487.58	329089.40	224427.66	104661.74
67+00	20.80	223.60	36.09	405.73	329125.48	224833.39	104292.09
67+50	26.80	191.54	48.48	345.95	329173.96	225179.35	103994.61
68+00	33.55	160.49	61.46	293.36	329235.43	225472.71	103762.72
68+50	41.06	131.38	75.99	243.25	329311.42	225715.96	103595.46
69+00	49.21	145.79	91.95	231.64	329403.36	225947.59	103455.77
69+50	31.65	195.32	82.35	286.45	329485.71	226234.04	103251.67
70+00	18.29	273.69	50.81	395.29	329536.52	226629.33	102907.19
70+50	29.05	274.41	48.08	463.07	329584.60	227092.39	102492.20
71+00	61.27	231.06	91.38	427.65	329675.97	227520.04	102155.93
71+50	32.61	249.61	94.93	406.30	329770.90	227926.35	101844.55
72+00	78.30	243.96	112.31	417.46	329883.21	228343.81	101539.40
72+06.26	89.08	245.38	21.19	51.93	329904.39	228395.74	101508.66
72+50	145.03	197.01	210.29	317.15	330114.68	228712.88	101401.80
73+00	83.57	148.18	234.53	283.56	330349.21	228996.45	101352.76
73+50	54.57	206.74	141.61	292.63	330490.82	229289.08	101201.74
74+00	73.43	230.69	131.27	361.50	330622.09	229650.59	100971.50
74+50	127.77	194.45	206.17	351.71	330828.26	230002.30	100825.96
75+00	178.04	152.43	312.79	287.46	331141.05	230289.76	100851.29
75+50	241.12	112.78	427.97	220.23	331569.01	230509.99	101059.02
76+00	408.62	75.65	662.47	156.81	332231.48	230666.80	101564.68
76+06.26	395.47	71.20	102.54	15.32	332334.02	230682.11	101651.91
76+50	378.40	41.79	689.52	82.37	333023.55	230764.48	102259.06
77+00	490.31	13.64	884.79	46.20	333908.34	230810.68	103097.66
77+50	697.70	0.00	1210.00	11.37	335118.35	230822.05	104296.30
78+00	675.93	0.00	1399.06	0.00	336517.41	230822.05	105695.36
78+50	959.23	0.00	1665.44	0.00	338182.85	230822.05	107360.80
79+00	1133.82	0.00	2131.81	0.00	340314.66	230822.05	109492.62
79+50	1226.87	0.00	2404.41	0.00	342719.07	230822.05	111897.03
80+00	1572.29	0.00	2850.99	0.00	345570.07	230822.05	114748.02
			3517.73	0.00	349087.80	230822.05	118265.75

80+50	1881.49	0.00					
81+00	2091.30	0.00	4046.36	0.00	353134.16	230822.05	122312.11
81+50	2451.60	0.00	4627.03	0.00	357761.19	230822.05	126939.14
82+00	3098.21	0.00	5652.59	0.00	363413.78	230822.05	132591.73
82+50	3835.49	0.00	7062.10	0.00	370475.88	230822.05	139653.84
83+00	4759.08	0.00	8753.73	0.00	379229.62	230822.05	148407.57
83+50	6488.37	0.00	11455.74	0.00	390685.36	230822.05	159863.31
84+00	8458.54	0.00	15223.71	0.00	405909.06	230822.05	175087.02
84+50	10233.35	0.00	19038.04	0.00	424947.11	230822.05	194125.06
85+00	11701.82	0.00	22341.38	0.00	447288.48	230822.05	216466.44
85+50	13245.35	0.00	25409.15	0.00	472697.64	230822.05	241875.59
86+00	13726.02	0.00	27470.84	0.00	500168.47	230822.05	269346.43
86+50	13530.25	0.00	27761.01	0.00	527929.48	230822.05	297107.44
87+00	13519.41	0.00	27550.58	0.00	555480.06	230822.05	324658.01
87+50	13973.82	0.00	28002.36	0.00	583482.42	230822.05	352660.37
88+00	15715.51	0.00	30239.13	0.00	613721.55	230822.05	382899.50
88+50	16841.53	0.00	33159.95	0.00	646881.50	230822.05	416059.45
89+00	18019.79	0.00	35506.90	0.00	682388.40	230822.05	451566.35
89+38.16	18918.60	0.00	28715.89	0.00	711104.29	230822.05	480282.24
89+50	19072.51	0.00	9176.07	0.00	720280.36	230822.05	489458.32
90+00	17818.22	0.00	37975.35	0.00	758255.71	230822.05	527433.67
90+50	17990.05	0.00	37400.60	0.00	795656.31	230822.05	564834.27
91+00	18912.72	0.00	39164.69	0.00	834821.00	230822.05	603998.96
91+50	19891.47	0.00	41899.97	0.00	876720.98	230822.05	645898.93
92+00	21821.14	0.00	45942.26	0.00	922663.24	230822.05	691841.19
92+50	23756.94	0.00	51338.92	0.00	974002.16	230822.05	743180.11
93+00	23140.68	0.00	53702.52	0.00	1027704.68	230822.05	796882.63
93+38.16	21861.67	0.00	39511.13	0.00	1067215.80	230822.05	836393.76
93+50	20981.94	0.00	11644.76	0.00	1078860.56	230822.05	848038.51
94+00	15076.30	721.44	41246.89	574.12	1120107.45	231396.16	888711.29
94+50	9355.09	1500.81	27708.63	1717.90	1147816.08	233114.07	914702.01
95+00	4426.82	3955.35	15332.50	4582.74	1163148.58	237696.80	925451.78
95+48.08	1795.61	2434.72	6505.30	5108.92	1169653.88	242805.72	926848.16
95+50	1698.53	2451.88	129.09	168.19	1169782.98	242973.92	926809.06
96+00	422.69	3233.44	2060.73	5059.04	1171843.71	248032.96	923810.75
96+50	0.00	5263.70	423.06	7454.39	1172266.77	255487.34	916779.43
97+00	0.00	7660.16	0.00	11134.34	1172266.77	266621.69	905645.08
97+50	0.00	9616.78	0.00	14685.68	1172266.77	281307.37	890959.40
98+00	0.00	10796.60	0.00	17240.54	1172266.77	298547.91	873718.86
98+50	0.00	11426.23	0.00	18680.31	1172266.77	317228.22	855038.55
99+00	0.00	11806.63	0.00	19446.88	1172266.77	336675.10	835591.67
99+48.08	0.00	11584.64	0.00	18767.63	1172266.77	355442.73	816824.04
99+50	0.00	11571.75	0.00	741.84	1172266.77	356184.57	816082.20
100+00	0.00	11653.15	0.00	19354.09	1172266.77	375538.66	796728.11
100+50	0.00	11252.52	0.00	19088.06	1172266.77	394626.72	777640.05
101+00	0.00	10675.92	0.00	18273.70	1172266.77	412900.42	759366.35
101+50	0.00	10430.11	0.00	17588.35	1172266.77	430488.77	741778.00
102+00	0.00	10175.74	0.00	17171.54	1172266.77	447660.31	724606.46

102+50	0.00	9810.83	0.00	16655.48	1172266.77	464315.79	707950.98
103+00	0.00	9732.82	0.00	16286.38	1172266.77	480602.17	691664.60
103+50	0.00	9270.84	0.00	15836.38	1172266.77	496438.55	675828.22
104+00	0.00	8617.73	0.00	14907.14	1172266.77	511345.69	660921.08
104+50	0.00	8485.61	0.00	14252.78	1172266.77	525598.48	646668.30
105+00	0.00	8111.30	0.00	13830.76	1172266.77	539429.23	632837.54
105+50	0.00	7760.95	0.00	13226.88	1172266.77	552656.11	619610.66
105+77.53	0.00	7620.27	0.00	7057.70	1172266.77	559713.81	612552.96
106+00	0.00	7466.91	0.00	5651.17	1172266.77	565364.98	606901.79
106+50	0.00	7131.65	0.00	12178.02	1172266.77	577543.00	594723.77
107+00	0.00	6788.25	0.00	11626.42	1172266.77	589169.42	583097.35
107+50	0.00	6467.23	0.00	11087.76	1172266.77	600257.18	572009.59
108+00	0.00	6193.53	0.00	10609.12	1172266.77	610866.30	561400.47
108+50	0.00	6021.96	0.00	10256.68	1172266.77	621122.98	551143.79
109+00	0.00	5833.03	0.00	9983.42	1172266.77	631106.40	541160.37
109+50	0.00	5836.74	0.00	9868.41	1172266.77	640974.80	531291.97
109+77.53	0.00	5812.86	0.00	5442.87	1172266.77	646417.68	525849.09
110+00	0.00	5775.40	0.00	4425.15	1172266.77	650842.83	521423.94
110+11.47	0.00	5759.19	0.00	2249.57	1172266.77	653092.40	519174.37
110+50	0.00	5792.63	0.00	7277.21	1172266.77	660369.61	511897.16
111+00	0.00	5627.16	0.00	9354.13	1172266.77	669723.74	502543.03
111+50	0.00	5389.09	0.00	9037.30	1172266.77	678761.04	493505.73
112+00	0.00	4830.93	0.00	8401.97	1172266.77	687163.01	485103.76
112+50	0.00	4121.29	0.00	7377.73	1172266.77	694540.74	477726.03
113+00	0.00	3329.12	0.00	6154.65	1172266.77	700695.39	471571.38
113+50	0.00	2661.75	0.00	4965.49	1172266.77	705660.88	466605.89
114+00	0.00	2011.19	0.00	3885.25	1172266.77	709546.13	462720.65
114+11.47	0.00	1837.75	0.00	735.56	1172266.77	710281.69	461985.08
114+50	0.00	1202.62	0.00	1952.37	1172266.77	712234.06	460032.71
114+68.68	0.00	893.68	0.00	652.79	1172266.77	712886.85	459379.92

Segment E

Segment: E

Station	END AREA VOLUME LISTING WITH CURVE CORRECTION		Cut 1.1000		Fill 0.9000		Mass Ordinate
	Cut Area (sqft)	Fill Area (sqft)	Volume (yds)	Volume (yds)	Tot Vol (yds)	Tot Vol (yds)	
0+00	39.39	209.61					
0+50	241.01	13.05	285.59	185.55	285.59	185.55	100.04
1+00	515.72	0.00	770.75	10.87	1056.33	196.42	859.91
1+50	789.71	0.00	1329.61	0.00	2385.94	196.42	2189.52
2+00	1099.72	0.00	1924.42	0.00	4310.36	196.42	4113.94
2+50	1360.32	0.00	2505.60	0.00	6815.96	196.42	6619.54
3+00	1574.90	0.00	2989.57	0.00	9805.53	196.42	9609.11
3+50	1779.04	0.00	3416.06	0.00	13221.59	196.42	13025.17
4+00	2037.96	0.00	3887.69	0.00	17109.27	196.42	16912.85
4+50	2313.81	0.00	4432.35	0.00	21541.63	196.42	21345.21
5+00	2495.55	0.00	4898.42	0.00	26440.05	196.42	26243.63
5+50	2525.07	0.00	5113.59	0.00	31553.64	196.42	31357.21
6+00	2613.19	0.00	5233.40	0.00	36787.04	196.42	36590.62
6+50	2613.19	0.00	5788.64	0.00	42575.69	196.42	42379.26
7+00	3070.21	0.00	6666.28	0.00	49241.97	196.42	49045.54
7+50	3474.87	0.00	7365.58	0.00	56607.55	196.42	56411.12
8+00	3756.79	0.00	8069.08	0.00	64676.62	196.42	64480.20
8+50	4165.57	0.00	8793.92	0.00	73470.54	196.42	73274.12
9+00	4468.46	0.00	9385.28	0.00	82855.82	196.42	82659.40
9+50	4746.18	0.00	10040.59	0.00	92896.42	196.42	92699.99
10+00	5111.86	0.00	10661.17	0.00	103557.59	196.42	103361.17
10+50	5355.47	0.00	11204.61	0.00	114762.20	196.42	114565.77
11+00	5645.41	0.00	11853.01	0.00	126615.21	196.42	126418.78
11+50	5992.09	0.00	12435.35	0.00	139050.56	196.42	138854.13
12+00	6217.17	0.00	12788.52	0.00	151839.07	196.42	151642.65
12+50	6338.83	0.00	13075.97	0.00	164915.04	196.42	164718.62
13+00	6499.39	0.00	13449.58	0.00	178364.62	196.42	178168.20
13+50	6705.65	0.00	13866.92	0.00	192231.54	196.42	192035.12
14+00	6909.14	0.00	14195.42	0.00	206426.96	196.42	206230.54
14+50	7028.18	0.00	14126.98	0.00	220553.94	196.42	220357.52
15+00	6841.95	0.00	13579.36	0.00	234133.30	196.42	233936.88
15+50	6490.52	0.00	12873.27	0.00	247006.57	196.42	246810.15
16+00	6148.69	0.00	12068.42	0.00	259074.99	196.42	258878.57
16+50	5700.30	0.00	10552.30	0.00	269627.30	196.42	269430.87
17+00	4660.14	0.00	8777.51	0.00	278404.80	196.42	278208.38
17+50	3957.78	0.00	7018.92	0.00	285423.72	196.42	285227.30
18+00	2933.53	0.00	5167.32	17.95	290591.05	214.37	290376.67
18+50	2139.85	21.54	3772.82	86.49	294363.86	300.86	294063.00
19+00	1564.37	82.24	2814.65	185.99	297178.51	486.85	296691.66
19+50	1199.10	140.95	1933.24	323.54	299111.75	810.39	298301.36
20+00	698.99	247.30	979.11	654.74	300090.86	1465.12	298625.74
20+50	262.32	538.39	272.05	1427.83	300362.91	2892.95	297469.96
21+00	4.78	1175.00	4.87	2842.32	300367.77	5735.27	294632.50
21+00	0.00	2235.79					

21+50	0.00	3235.96	0.00	4559.79	300367.77	10295.06	290072.71
22+00	0.00	3806.75	0.00	5868.92	300367.77	16163.99	284203.79
22+50	0.00	3841.84	0.00	6373.82	300367.77	22537.81	277829.97
23+00	0.00	3604.69	0.00	6205.44	300367.77	28743.25	271624.53
23+50	0.00	3305.30	0.00	5758.32	300367.77	34501.57	265866.20
24+00	0.00	3423.45	0.00	5607.29	300367.77	40108.86	260258.92
24+50	0.00	3156.52	0.00	5483.31	300367.77	45592.16	254775.61
25+00	0.00	2719.59	0.00	4896.76	300367.77	50488.92	249878.85
25+50	0.00	2461.11	0.00	4317.25	300367.77	54806.17	245561.60
26+00	0.00	2310.67	0.00	3976.48	300367.77	58782.65	241585.13
26+50	0.00	2001.54	0.00	3593.51	300367.77	62376.16	237991.62
27+00	0.00	1543.28	0.00	2954.01	300367.77	65330.17	235037.61
27+50	0.00	1085.49	0.00	2190.64	300367.77	67520.80	232846.97
28+00	0.00	764.12	0.00	1541.34	300367.77	69062.15	231305.63
28+50	0.00	547.11	0.00	1092.69	300367.77	70154.84	230212.94
29+00	0.01	310.39	0.01	714.58	300367.79	70869.42	229498.37
29+50	4.90	130.65	5.01	367.53	300372.79	71236.95	229135.85
30+00	6.88	91.10	12.00	184.79	300384.80	71421.74	228963.06
30+50	11.61	112.47	18.84	169.64	300403.64	71591.39	228812.25
31+00	121.56	0.00	135.65	93.72	300539.28	71685.11	228854.17
31+50	38.01	9.78	162.53	8.15	300701.81	71693.26	229008.55
32+00	12.60	92.44	51.54	85.19	300753.35	71778.45	228974.90
32+50	14.59	123.39	27.69	179.86	300781.04	71958.31	228822.73
33+00	16.73	100.69	31.89	186.74	300812.93	72145.05	228667.88
33+50	35.73	74.39	53.43	145.91	300866.36	72290.96	228575.40
34+00	69.30	42.93	106.98	97.77	300973.34	72388.73	228584.61
34+50	27.95	50.17	99.05	77.59	301072.39	72466.32	228606.07
35+00	50.88	47.49	80.29	81.38	301152.68	72547.70	228604.98
35+50	126.22	24.96	180.38	60.37	301333.06	72608.07	228724.98
36+00	137.30	33.16	268.41	48.43	301601.46	72656.50	228944.96
36+50	44.78	57.61	185.45	75.64	301786.91	72732.14	229054.77
37+00	2.08	257.14	47.72	262.30	301834.64	72994.44	228840.20
37+50	0.00	451.13	2.12	590.23	301836.76	73584.67	228252.09
38+00	0.00	527.28	0.00	815.34	301836.76	74400.01	227436.74
38+50	0.00	689.46	0.00	1013.95	301836.76	75413.97	226422.79
39+00	0.00	1015.63	0.00	1420.91	301836.76	76834.88	225001.88
39+50	0.00	1439.55	0.00	2045.98	301836.76	78880.86	222955.89
40+00	0.00	2139.52	0.00	2982.56	301836.76	81863.42	219973.33
40+50	0.00	2878.96	0.00	4182.07	301836.76	86045.49	215791.26
41+00	0.00	3355.15	0.00	5195.09	301836.76	91240.58	210596.18
41+50	0.00	3520.26	0.00	5729.51	301836.76	96970.09	204866.67
42+00	0.00	3522.99	0.00	5869.38	301836.76	102839.47	198997.29
42+50	0.00	3613.61	0.00	5947.17	301836.76	108786.63	193050.12
43+00	0.00	3708.56	0.00	6101.81	301836.76	114888.44	186948.32
43+50	0.00	3381.97	0.00	5908.77	301836.76	120797.22	181039.54
44+00	0.00	3254.77	0.00	5530.61	301836.76	126327.83	175508.93
44+50	0.00	3160.25	0.00	5345.84	301836.76	131673.67	170163.08
			0.00	5110.30	301836.76	136783.97	165052.78

45+00	0.00	2972.11	0.00	4798.68	301836.76	141582.65	160254.11
45+50	0.00	2786.30	0.00	4491.10	301836.76	146073.75	155763.01
46+00	0.00	2603.01	0.00	4187.69	301836.76	150261.44	151575.32
46+50	0.00	2422.22	0.00	3888.49	301836.76	154149.93	147686.83
47+00	0.00	2243.97	0.00	3518.33	301836.76	157668.26	144168.49
47+50	0.00	1978.03	28.60	3088.79	301865.36	160757.06	141108.30
48+00	28.08	1728.52	38.85	2890.83	301904.21	163647.89	138256.32
48+50	10.06	1740.48	88.12	2669.40	301992.33	166317.29	135675.04
49+00	76.46	1462.80	206.69	2350.52	302199.02	168667.81	133531.21
49+50	126.47	1357.83	176.81	2323.21	302375.83	170991.02	131384.81
50+00	47.12	1430.02	209.33	2295.75	302585.15	173286.77	129298.38
50+50	158.40	1324.88	179.38	2482.22	302764.53	175768.98	126995.55
51+00	17.72	1653.78	18.04	3141.96	302782.57	178910.94	123871.63
51+50	0.00	2116.57	0.00	3809.61	302782.57	182720.55	120062.02
52+00	0.00	2454.96	0.00	4260.66	302782.57	186981.22	115801.36
52+50	0.00	2657.83	0.00	4335.07	302782.57	191316.29	111466.29
53+00	0.00	2544.25	0.00	4119.41	302782.57	195435.69	107346.88
53+50	0.00	2399.04	0.00	3879.54	302782.57	199315.24	103467.34
54+00	0.00	2256.41	0.00	3643.97	302782.57	202959.21	99823.37
54+50	0.00	2116.36	0.00	3412.69	302782.57	206371.90	96410.67
55+00	0.00	1978.88	0.00	3181.82	302782.57	209553.72	93228.85
55+50	0.00	1839.31	0.00	2901.81	302782.57	212455.53	90327.04
56+00	0.00	1642.86	0.00	2650.93	302782.57	215106.46	87676.11
56+50	0.00	1538.25	0.00	2540.32	302782.57	217646.79	85135.79
57+00	0.00	1510.14	0.00	2454.08	302782.57	220100.86	82681.71
57+50	0.00	1434.76	0.00	2297.05	302782.57	222397.92	80384.66
58+00	0.00	1321.70	0.00	2097.64	302782.57	224495.56	78287.01
58+50	0.00	1195.47	0.00	1883.37	302782.57	226378.93	76403.64
59+00	0.00	1064.57	0.00	1697.00	302782.57	228075.93	74706.65
59+50	0.00	971.82	0.00	1518.22	302782.57	229594.15	73188.42
60+00	0.00	850.04	0.00	1298.77	302782.57	230892.92	71889.66
60+50	0.00	708.48	0.00	1101.66	302782.57	231994.58	70788.00
61+00	0.00	613.52	0.00	942.96	302782.57	232937.54	69845.04
61+50	0.00	518.03	0.00	779.37	302782.57	233716.91	69065.66
62+00	0.00	417.22	0.00	618.79	302782.57	234335.70	68446.87
62+50	0.00	325.34	14.91	457.69	302797.48	234793.39	68004.09
63+00	14.64	223.89	100.14	265.39	302897.62	235058.79	67838.83
63+50	83.68	94.58	214.34	101.56	303111.96	235160.35	67951.61
64+00	126.77	27.29	315.83	68.66	303427.80	235229.01	68198.79
64+50	183.33	55.10	545.46	127.33	303973.25	235356.33	68616.92
65+00	352.21	97.70	618.22	145.88	304591.47	235502.21	69089.26
65+50	254.76	77.36	562.82	98.32	305154.29	235600.53	69553.76
66+00	297.82	40.62	681.16	78.39	305835.45	235678.92	70156.54
66+50	370.96	53.44	673.16	126.07	306508.61	235804.98	70703.63
67+00	289.97	97.84	519.97	209.72	307028.59	236014.70	71013.88
67+50	220.55	153.83	381.64	307.86	307410.22	236322.56	71087.66
68+00	154.15	215.60	811.11	398.58	308221.33	236721.14	71500.19
68+50	642.22	262.70					

			1440.05	442.86	309661.38	237164.00	72497.38
69+00	771.65	268.73	3335.06	440.74	312996.45	237604.74	75391.71
69+50	2502.77	260.15	7285.01	371.44	320281.46	237976.18	82305.28
70+00	4649.78	185.58	11889.91	306.03	332171.36	238282.21	93889.15
70+50	7023.94	181.66	15826.42	270.92	347997.79	238553.13	109444.66
71+00	8514.73	143.44	18347.16	284.33	366344.95	238837.46	127507.49
71+50	9498.85	197.76	18956.83	365.01	385301.78	239202.47	146099.31
72+00	9113.31	240.26	18101.72	242.71	403403.50	239445.18	163958.32
72+50	8659.28	50.99	16543.56	124.26	419947.06	239569.44	180377.62
73+00	7583.49	98.12	13942.39	217.91	433889.45	239787.36	194102.09
73+50	6105.40	163.37	10767.74	221.72	444657.19	240009.07	204648.12
74+00	4466.56	102.69	7516.84	126.72	452174.03	240135.80	212038.23
74+50	2913.61	49.38	4350.27	62.16	456524.30	240197.96	216326.34
75+00	1357.57	25.21	2789.13	21.88	459313.43	240219.84	219093.60
75+50	1380.86	1.04	3127.39	0.87	462440.82	240220.70	222220.12
76+00	1689.67	0.00	3799.44	0.00	466240.26	240220.70	226019.56
76+50	2040.69	0.00	4450.57	0.00	470690.84	240220.70	230470.14
77+00	2328.97	0.00	4980.89	0.00	475671.73	240220.70	235451.02
77+50	2561.36	0.00	5317.60	0.00	480989.32	240220.70	240768.62
78+00	2659.56	0.00	5288.88	0.00	486278.21	240220.70	246057.50
78+50	2533.16	0.00	4941.30	0.00	491219.50	240220.70	250998.80
79+00	2318.30	0.00	5012.12	0.00	496231.63	240220.70	256010.93
79+50	2602.70	0.00	6435.33	0.00	502666.95	240220.70	262446.25
80+00	3715.62	0.00	9432.04	0.00	512099.00	240220.70	271878.30
80+50	5544.93	0.00	12718.20	0.00	524817.19	240220.70	284596.49
81+00	6942.03	0.00	15409.92	0.00	540227.12	240220.70	300006.42
81+50	8187.71	0.00	18027.17	0.00	558254.28	240220.70	318033.58
82+00	9511.69	0.00	20217.57	0.00	578471.86	240220.70	338251.16
82+50	10338.29	0.00	21292.37	0.00	599764.23	240220.70	359543.53
83+00	10566.94	0.00	21582.31	0.00	621346.54	240220.70	381125.84
83+50	10622.96	0.00	21471.98	0.00	642818.53	240220.70	402597.82
84+00	10458.62	0.00	20887.47	0.00	663705.99	240220.70	423485.29
84+50	10049.08	0.00	19829.95	0.00	683535.94	240220.70	443315.24
85+00	9420.32	0.00	18906.16	0.00	702442.10	240220.70	462221.40
85+50	9142.08	0.00	18387.75	0.00	720829.84	240220.70	480609.14
86+00	8911.34	0.00	18692.85	0.00	739522.69	240220.70	499301.99
86+50	9441.64	0.00	19315.41	0.00	758838.10	240220.70	518617.40
87+00	9522.58	0.00	19468.65	0.00	778306.75	240220.70	538086.05
87+50	9592.10	0.00	19611.24	0.00	797917.99	240220.70	557697.29
88+00	9662.58	0.00	19210.46	0.00	817128.46	240220.70	576907.76
88+50	9198.61	0.00	18013.73	0.00	835142.19	240220.70	594921.49
89+00	8487.60	0.00	16365.03	0.00	851507.22	240220.70	611286.52
89+50	7579.89	0.00	14357.32	0.00	865864.54	240220.70	625643.84
90+00	6516.40	0.00	12172.62	0.00	878037.16	240220.70	637816.46
90+50	5434.91	0.00	9755.71	0.00	887792.88	240220.70	647572.18
91+00	4143.43	0.00	6940.66	0.00	894733.54	240220.70	654512.84
91+50	2671.04	0.00	4293.51	0.00	899027.04	240220.70	658806.34
92+00	1544.40	0.00					

92+50	672.50	28.39	2257.95	23.66	901284.99	240244.36	661040.64
93+00	126.71	207.24	814.01	196.36	902099.00	240440.72	661658.29
93+50	0.00	595.07	129.06	668.59	902228.06	241109.30	661118.76
94+00	0.00	1144.79	0.00	1449.88	902228.06	242559.18	659668.88
94+50	0.00	1632.03	0.00	2314.01	902228.06	244873.19	657354.87
95+00	0.00	1920.62	0.00	2960.54	902228.06	247833.73	654394.33
95+50	0.00	2104.08	0.00	3353.91	902228.06	251187.64	651040.42
96+00	0.00	2210.89	0.00	3595.81	902228.06	254783.45	647444.61
96+50	0.00	2372.33	0.00	3819.35	902228.06	258602.80	643625.26
97+00	0.00	2598.71	0.00	4142.54	902228.06	262745.34	639482.72
97+50	0.00	2800.14	0.00	4499.04	902228.06	267244.38	634983.68
98+00	0.00	2975.10	0.00	4812.70	902228.06	272057.08	630170.98
98+50	0.00	2912.42	0.00	4906.27	902228.06	276963.35	625264.71
99+00	0.00	2550.20	0.00	4552.19	902228.06	281515.53	620712.53
99+50	0.00	2162.09	0.00	3926.91	902228.06	285442.45	616785.61
100+00	0.00	1806.58	0.00	3307.23	902228.06	288749.68	613478.38
100+50	0.00	1692.42	0.00	2915.83	902228.06	291665.51	610562.55
101+00	0.00	1134.00	0.00	2355.35	902228.06	294020.86	608207.20
101+50	0.00	818.56	0.00	1627.13	902228.06	295647.99	606580.07
102+00	0.00	631.39	0.00	1208.29	902228.06	296856.27	605371.79
102+50	0.00	531.33	0.00	968.93	902228.06	297825.20	604402.86
103+00	0.00	487.25	0.00	848.82	902228.06	298674.02	603554.04
103+50	19.60	25.61	19.96	427.39	902248.02	299101.41	603146.62
104+00	576.80	0.00	607.45	21.34	902855.47	299122.75	603732.72
104+50	1019.14	0.00	1625.50	0.00	904480.97	299122.75	605358.21
105+00	1035.65	0.00	2092.84	0.00	906573.81	299122.75	607451.06
105+50	1096.25	4.87	2171.38	4.06	908745.19	299126.81	609618.38
106+00	1111.88	8.64	2249.02	11.26	910994.21	299138.06	611856.15
106+50	1505.43	0.00	2665.78	7.20	913659.99	299145.27	614514.73
107+00	1763.38	0.00	3329.34	0.00	916989.34	299145.27	617844.07
107+50	1762.83	0.00	3591.51	0.00	920580.85	299145.27	621435.58
108+00	1015.27	0.00	2829.55	0.00	923410.40	299145.27	624265.13
108+50	1030.62	0.00	2083.78	0.00	925494.18	299145.27	626348.91
109+00	1028.34	0.00	2097.09	0.00	927591.27	299145.27	628446.00
109+50	694.21	5.61	1754.45	4.68	929345.72	299149.95	630195.78
110+00	245.34	272.47	956.95	231.74	930302.67	299381.68	630920.99
110+50	60.89	628.39	311.90	750.72	930614.57	300132.40	630482.17
111+00	0.33	995.76	62.36	1353.46	930676.93	301485.86	629191.07
111+50	0.00	1225.76	0.34	1851.27	930677.27	303337.13	627340.15
112+00	0.00	1306.38	0.00	2110.12	930677.27	305447.24	625230.03
112+50	0.00	1247.82	0.00	2128.50	930677.27	307575.75	623101.53
113+00	0.00	1329.76	0.00	2147.99	930677.27	309723.73	620953.54
113+50	0.00	1499.06	0.00	2357.35	930677.27	312081.08	618596.19
114+00	0.00	1648.08	0.00	2622.61	930677.27	314703.69	615973.58
114+50	0.00	1617.15	0.00	2721.02	930677.27	317424.71	613252.56
115+00	0.00	1831.37	0.00	2873.77	930677.27	320298.48	610378.80
115+50	0.00	1947.72	0.00	3149.24	930677.27	323447.72	607229.55
			0.00	3471.67	930677.27	326919.39	603757.89

116+00	0.00	2218.28	0.00	4218.73	930677.27	331138.12	599539.16
116+50	0.00	2844.20	0.00	4446.33	930677.27	335584.45	595092.83
117+00	0.00	2491.40	0.00	3685.95	930677.27	339270.40	591406.87
117+50	0.00	1931.75	0.00	2836.07	930677.27	342106.47	588570.80
118+00	0.00	1471.54	0.00	2531.61	930677.27	344638.08	586039.19
118+50	0.00	1566.40	0.00	2747.16	930677.27	347385.24	583292.04
119+00	0.00	1730.19	0.00	3205.68	930677.27	350590.91	580086.36
119+50	0.00	2116.62	0.00	3774.01	930677.27	354364.92	576312.35
120+00	0.00	2412.19	0.00	4245.86	930677.27	358610.79	572066.49
120+50	0.00	2682.84	0.00	4813.72	930677.27	363424.51	567252.77
121+00	0.00	3093.62	0.00	5393.77	930677.27	368818.28	561858.99
121+50	0.00	3378.91	0.00	5836.11	930677.27	374654.39	556022.88
122+00	0.00	3624.43	0.00	5634.87	930677.27	380289.26	550388.02
122+50	0.00	3137.41	0.00	4498.56	930677.27	384787.82	545889.45
123+00	0.00	2260.86	0.00	3386.30	930677.27	388174.12	542503.16
123+50	0.00	1802.69	0.00	2968.42	930677.27	391142.54	539534.73
124+00	0.00	1759.42	0.00	3147.41	930677.27	394289.95	536387.33
124+50	0.00	2017.47	0.00	3627.01	930677.27	397916.95	532760.32
125+00	0.00	2334.94	0.00	4163.38	930677.27	402080.33	528596.94
125+50	0.00	2661.11	0.00	4411.27	930677.27	406491.60	524185.67
126+00	0.00	2632.42	0.00	4192.48	930677.27	410684.09	519993.19
126+50	0.00	2398.56	0.00	3743.49	930677.27	414427.57	516249.70
127+00	0.00	2093.62	0.00	3311.30	930677.27	417738.87	512938.40
127+50	0.00	1879.94	0.00	3134.40	930677.27	420873.27	509804.01
128+00	0.00	1881.34	0.00	3240.09	930677.27	424113.36	506563.92
128+50	0.00	2006.77	0.00	2981.86	930677.27	427095.22	503582.06
129+00	0.00	1571.46	0.00	2167.18	930677.27	429262.40	501414.87
129+50	0.00	1029.16	25.44	1323.52	930702.71	430585.92	500116.79
130+00	24.98	559.06	26.62	1099.38	930729.33	431685.29	499044.04
130+50	1.16	760.19	1.19	1459.60	930730.52	433144.89	497585.62
131+00	0.00	991.33	0.00	1815.02	930730.52	434959.92	495770.60
131+50	0.00	1186.69	0.00	2073.62	930730.52	437033.54	493696.98
132+00	0.00	1301.65	0.00	1965.09	930730.52	438998.62	491731.90
132+50	0.00	1056.45	0.00	1311.97	930730.52	440310.59	490419.93
133+00	0.00	517.91	7.37	361.67	930737.89	440672.26	490065.63
133+32.59	11.09	147.91					

Segment F1

Segment: F1

END AREA VOLUME LISTING WITH CURVE CORRECTION								
Station	Cut		Fill		Cut 1.1000		Fill 0.9000	
	Area (sqft)	Area (sqft)	Volume (yds)	Volume (yds)	Tot Vol (yds)	Tot Vol (yds)	Tot Vol (yds)	Mass Ordinate
0+00	0.00	702.07						
0+50	159.49	130.78	162.44	694.04	162.44	694.04	-531.60	
1+00	756.04	0.00	932.48	108.98	1094.92	803.02	291.90	
1+50	1145.78	0.00	1937.04	0.00	3031.96	803.02	2228.94	
2+00	1113.17	0.00	2300.78	0.00	5332.73	803.02	4529.72	
2+50	904.04	0.00	2054.56	0.00	7387.30	803.02	6584.28	
3+00	677.27	35.65	1610.59	29.71	8997.89	832.73	8165.16	
3+50	203.12	456.17	896.69	409.85	9894.58	1242.58	8652.01	
4+00	28.97	1167.46	236.39	1353.03	10130.97	2595.61	7535.36	
4+50	70.65	1528.63	101.47	2246.74	10232.44	4842.35	5390.09	
5+00	369.74	1463.13	448.54	2493.13	10680.98	7335.48	3345.50	
5+50	455.44	1116.41	840.45	2149.61	11521.43	9485.09	2036.34	
6+00	479.57	728.68	952.33	1537.58	12473.76	11022.67	1451.09	
6+50	524.43	367.37	1022.60	913.37	13496.36	11936.04	1560.31	
7+00	955.94	0.00	1507.79	306.14	15004.15	12242.18	2761.96	
7+50	2471.35	0.00	3490.76	0.00	18494.91	12242.18	6252.73	
8+00	4170.06	0.00	6764.40	0.00	25259.31	12242.18	13017.13	
8+50	4876.69	0.00	9214.29	0.00	34473.59	12242.18	22231.41	
9+00	4126.61	0.00	9170.04	0.00	43643.63	12242.18	31401.45	
9+50	3123.67	0.00	7384.54	0.00	51028.17	12242.18	38785.99	
10+00	2552.32	0.00	5781.09	0.00	56809.27	12242.18	44567.09	
10+50	2459.30	0.00	5104.43	0.00	61913.69	12242.18	49671.51	
11+00	2750.38	0.00	5306.16	0.00	67219.85	12242.18	54977.67	
11+50	3931.28	0.00	6805.40	0.00	74025.26	12242.18	61783.08	
12+00	5426.92	0.00	9531.51	0.00	83556.77	12242.18	71314.59	
12+50	5187.82	0.00	10811.32	0.00	94368.09	12242.18	82125.90	
13+00	3751.17	6.06	9104.53	5.05	103472.62	12247.24	91225.38	
13+50	1507.75	687.51	5356.31	577.98	108828.92	12825.22	96003.71	
14+00	348.01	950.41	1890.13	1364.93	110719.05	14190.15	96528.90	
14+50	0.00	1322.10	354.46	1893.76	111073.51	16083.91	94989.60	
15+00	52.37	507.71	53.34	1524.84	111126.86	17608.75	93518.10	
15+50	132.94	183.37	188.74	575.90	111315.60	18184.65	93130.95	
16+00	43.80	419.23	180.01	502.17	111495.61	18686.82	92808.79	
16+50	20.51	745.88	65.50	970.92	111561.11	19657.74	91903.37	
17+00	158.42	247.19	182.25	827.55	111743.36	20485.30	91258.06	
17+50	682.86	0.00	856.86	205.99	112600.22	20691.29	91908.93	
18+00	1648.26	0.00	2374.28	0.00	114974.50	20691.29	94283.21	
18+50	2347.98	0.00	4070.24	0.00	119044.74	20691.29	98353.45	
19+00	2269.35	0.00	4702.84	0.00	123747.58	20691.29	103056.30	
19+50	1159.26	24.62	3492.10	20.52	127239.69	20711.81	106527.88	
20+00	243.46	100.43	1428.69	104.21	128668.38	20816.01	107852.36	
20+50	155.67	690.40	406.52	659.02	129074.90	21475.04	107599.86	
			250.73	871.25	129325.63	22346.28	106979.35	

21+00	90.50	355.10					
21+50	315.16	0.00	413.17	295.91	129738.80	22642.20	107096.61
22+00	1556.53	0.00	1906.35	0.00	131645.15	22642.20	109002.96
22+50	1190.79	0.00	2798.20	0.00	134443.35	22642.20	111801.16
22+67.05	1066.50	0.00	783.91	0.00	135227.26	22642.20	112585.06
23+00	1142.05	0.00	1482.28	0.00	136709.54	22642.20	114067.35
23+50	1307.70	0.00	2494.42	0.00	139203.96	22642.20	116561.77
24+00	1625.24	0.00	2986.75	0.00	142190.71	22642.20	119548.52
24+50	2086.69	0.00	3780.14	0.00	145970.85	22642.20	123328.65
25+00	2699.25	0.00	4873.45	0.00	150844.30	22642.20	128202.11
25+50	3229.39	0.00	6036.27	0.00	156880.57	22642.20	134238.38
26+00	3617.14	0.00	6969.47	0.00	163850.05	22642.20	141207.85
26+50	3850.76	0.00	7600.09	0.00	171450.14	22642.20	148807.94
26+67.05	3813.76	0.00	2659.31	0.00	174109.45	22642.20	151467.25
27+00	3907.00	0.00	5178.35	0.00	179287.80	22642.20	156645.60
27+50	4423.25	0.00	8478.24	0.00	187766.04	22642.20	165123.84
28+00	5267.23	0.00	9863.84	0.00	197629.88	22642.20	174987.68
28+50	6227.59	0.00	11701.33	0.00	209331.21	22642.20	186689.02
29+00	6084.79	0.00	12533.01	0.00	221864.22	22642.20	199222.03
29+25.83	5560.67	0.00	6123.00	0.00	227987.23	22642.20	205345.03
29+50	4990.48	0.00	5198.78	0.00	233186.01	22642.20	210543.81
30+00	3742.90	0.00	8900.56	0.00	242086.57	22642.20	219444.38
30+50	2569.47	0.00	6433.40	0.00	248519.97	22642.20	225877.78
31+00	1876.41	0.00	4531.13	0.00	253051.11	22642.20	230408.91
31+50	1494.91	0.00	3435.71	0.00	256486.82	22642.20	233844.62
32+00	1170.01	0.00	2715.74	0.00	259202.56	22642.20	236560.36
32+50	538.66	70.05	1741.55	58.33	260944.10	22700.52	238243.58
33+00	0.00	842.11	548.77	759.72	261492.87	23460.24	238032.63
33+25.83	0.00	1743.38	0.00	1112.85	261492.87	24573.09	236919.79
33+50	0.00	2728.66	0.00	1801.73	261492.87	26374.82	235118.05
34+00	0.00	4946.27	0.00	6395.78	261492.87	32770.60	228722.28
34+50	0.00	6683.20	0.00	9691.23	261492.87	42461.83	219031.04
35+00	0.00	8356.17	0.00	12532.81	261492.87	54994.64	206498.23
35+50	0.00	9900.14	0.00	15213.59	261492.87	70208.23	191284.65
36+00	0.00	11319.27	0.00	17682.84	261492.87	87891.06	173601.81
36+50	0.00	12416.07	0.00	19779.45	261492.87	107670.51	153822.36
37+00	0.00	12867.59	0.00	21069.71	261492.87	128740.22	132752.65
37+50	0.00	12080.82	0.00	20790.34	261492.87	149530.56	111962.31
38+00	0.00	10972.59	0.00	19211.18	261492.87	168741.74	92751.13
38+50	0.00	11147.69	0.00	18433.57	261492.87	187175.32	74317.56
39+00	0.00	12538.48	0.00	19738.48	261492.87	206913.80	54579.08
39+50	0.00	13556.75	0.00	21746.03	261492.87	228659.82	32833.05
40+00	0.00	12853.01	0.00	22008.14	261492.87	250667.96	10824.91
40+50	0.00	11209.92	0.00	20052.45	261492.87	270720.41	-9227.53
41+00	0.00	9784.63	0.00	17495.46	261492.87	288215.87	-26722.99
41+50	0.00	11367.03	0.00	17626.38	261492.87	305842.25	-44349.38
42+00	0.00	13151.08	0.00	20431.75	261492.87	326274.00	-64781.13
42+50	0.00	13995.02	0.00	22621.74	261492.87	348895.75	-87402.87

43+00	0.00	12621.22	0.00	22180.20	261492.87	371075.95	-109583.07
43+50	0.00	10461.90	0.00	19235.94	261492.87	390311.88	-128819.01
44+00	0.00	9028.21	0.00	16241.76	261492.87	406553.64	-145060.77
44+50	0.00	8465.58	0.00	14578.16	261492.87	421131.80	-159638.92
45+00	0.00	7857.49	0.00	13602.56	261492.87	434734.36	-173241.49
45+50	0.00	7732.26	0.00	12991.46	261492.87	447725.82	-186232.95
46+00	0.00	7292.05	0.00	12520.26	261492.87	460246.08	-198753.20
46+50	0.00	7129.99	0.00	12018.37	261492.87	472264.44	-210771.57
47+00	0.00	7649.91	0.00	12316.58	261492.87	484581.03	-223088.15
47+50	0.00	8893.06	0.00	13785.81	261492.87	498366.83	-236873.96
48+00	0.00	10352.80	0.00	16038.22	261492.87	514405.05	-252912.18
48+50	0.00	10850.82	0.00	17669.68	261492.87	532074.73	-270581.86
49+00	0.00	10458.59	0.00	17757.84	261492.87	549832.57	-288339.70
49+50	0.00	9329.44	0.00	16490.03	261492.87	566322.60	-304829.72
50+00	0.00	7477.36	0.00	14005.67	261492.87	580328.27	-318835.39
50+50	0.00	4673.19	0.00	10125.47	261492.87	590453.73	-328960.86
51+00	0.00	2335.46	0.00	5840.54	261492.87	596294.28	-334801.40
51+50	0.00	1384.39	0.00	3099.87	261492.87	599394.15	-337901.27
52+00	0.00	2249.50	0.00	3028.24	261492.87	602422.39	-340929.51
52+50	0.00	3947.75	0.00	5164.37	261492.87	607586.76	-346093.89
53+00	0.00	4931.49	0.00	7399.37	261492.87	614986.13	-353493.26
53+50	0.00	4139.18	0.00	7558.90	261492.87	622545.03	-361052.15
54+00	0.00	2329.57	0.00	5390.63	261492.87	627935.66	-366442.78
54+50	52.77	966.16	53.74	2746.44	261546.62	630682.10	-369135.48
55+00	574.07	448.86	638.45	1179.18	262185.07	631861.28	-369676.21
55+50	1238.66	212.24	1846.30	550.91	264031.37	632412.19	-368380.83
56+00	1713.17	165.77	3006.49	315.01	267037.85	632727.20	-365689.35
56+50	1377.51	114.85	3147.91	233.85	270185.76	632961.06	-362775.29
57+00	1215.54	57.99	2641.06	144.04	272826.83	633105.09	-360278.27
57+50	938.90	32.71	2194.33	75.59	275021.16	633180.68	-358159.52
58+00	467.57	171.70	1432.52	170.34	276453.68	633351.03	-356897.34
58+50	16.01	451.69	492.54	519.49	276946.22	633870.52	-356924.30
59+00	0.00	1092.06	16.31	1286.46	276962.53	635156.97	-358194.44
59+50	0.00	1493.13	0.00	2154.32	276962.53	637311.29	-360348.76
60+00	0.00	1804.71	0.00	2748.20	276962.53	640059.49	-363096.96
60+50	0.00	2469.69	0.00	3562.00	276962.53	643621.49	-366658.96
61+00	0.00	3849.60	0.00	5266.08	276962.53	648887.57	-371925.04
61+50	0.00	5453.37	0.00	7752.48	276962.53	656640.05	-379677.52
62+00	0.00	5957.77	0.00	9509.28	276962.53	666149.33	-389186.81
62+50	0.00	4929.10	0.00	9072.38	276962.53	675221.72	-398259.19
63+00	0.00	3593.90	0.00	7102.50	276962.53	682324.22	-405361.69
63+50	0.00	2099.09	0.00	4744.16	276962.53	687068.37	-410105.85
64+00	28.58	949.04	29.11	2540.11	276991.64	689608.48	-412616.84
64+50	539.14	471.65	578.23	1183.91	277569.87	690792.40	-413222.53
65+00	1042.48	285.23	1610.90	630.74	279180.78	691423.13	-412242.36
65+50	927.29	203.06	2006.25	406.91	281187.03	691830.04	-410643.02
66+00	425.36	523.58	1377.70	605.54	282564.73	692435.58	-409870.85
			433.24	1682.57	282997.97	694118.15	-411120.18

66+50	0.00	1495.50	0.00	3397.34	282997.97	697515.49	-414517.52
67+00	0.00	2581.31	0.00	5273.83	282997.97	702789.32	-419791.36
67+50	0.00	3747.29	0.00	7326.64	282997.97	710115.96	-427117.99
68+00	0.00	5044.67	0.00	9152.84	282997.97	719268.80	-436270.84
68+50	0.00	5938.74	0.00	10406.93	282997.97	729675.73	-446677.76
69+00	0.00	6549.57	0.00	11227.43	282997.97	740903.15	-457905.19
69+50	0.00	6923.34	0.00	11742.87	282997.97	752646.03	-469648.06
70+00	0.00	7168.11	0.00	11951.53	282997.97	764597.55	-481599.58
70+50	0.00	7173.73	0.00	11664.39	282997.97	776261.94	-493263.97
71+00	0.00	6823.54	0.00	10936.83	282997.97	787198.77	-504200.80
71+50	0.00	6300.66	0.00	9823.83	282997.97	797022.60	-514024.63
72+00	0.00	5487.93	0.00	8382.43	282997.97	805405.03	-522407.07
72+50	0.00	4570.99	0.00	7261.64	282997.97	812666.67	-529668.71
73+00	0.00	4142.98	0.00	6830.72	282997.97	819497.40	-536499.43
73+50	0.00	4053.89	0.00	6508.00	282997.97	826005.40	-543007.43
74+00	0.00	3755.71	0.00	5604.15	282997.97	831609.55	-548611.58
74+50	0.00	2969.27	8.80	4146.42	283006.77	835755.97	-552749.20
75+00	8.64	2006.43	14.26	3805.67	283021.03	839561.64	-556540.62
75+50	5.36	2560.37	6.27	4656.12	283027.29	844217.76	-561190.47
76+00	0.80	3026.97	0.81	5329.98	283028.10	849547.74	-566519.63
76+50	0.00	3369.00	0.00	5971.05	283028.10	855518.79	-572490.68
77+00	0.00	3796.26	0.00	6477.24	283028.10	861996.02	-578967.92
77+50	0.00	3976.43	0.00	6605.49	283028.10	868601.52	-585573.41
78+00	0.00	3950.16	0.00	6190.96	283028.10	874792.48	-591764.37
78+50	0.00	3478.99	0.00	5682.28	283028.10	880474.76	-597446.65
79+00	0.00	3339.74	0.00	5556.37	283028.10	886031.13	-603003.03
79+50	0.00	3327.91	0.00	5343.10	283028.10	891374.23	-608346.13
80+00	0.00	3083.81	0.00	4845.26	283028.10	896219.49	-613191.38
80+50	0.00	2730.50	0.00	4374.75	283028.10	900594.23	-617566.13
81+00	0.00	2519.20	0.00	4092.17	283028.10	904686.40	-621658.30
81+50	0.00	2391.41	0.00	3843.23	283028.10	908529.64	-625501.53
82+00	0.00	2220.47	0.00	3923.10	283028.10	912452.74	-629424.64
82+50	0.00	2487.25	0.00	4948.87	283028.10	917401.61	-634373.51
83+00	0.00	3451.39	0.00	6686.37	283028.10	924087.99	-641059.88
83+50	0.00	4572.25	0.00	8449.84	283028.10	932537.83	-649509.72
84+00	0.00	5567.55	0.00	9540.46	283028.10	942078.29	-659050.19
84+50	0.00	5881.00	0.00	9465.65	283028.10	951543.94	-668515.83
85+00	0.00	5477.77	0.00	8469.90	283028.10	960013.84	-676985.74
85+50	0.00	4686.11	0.00	7917.37	283028.10	967931.21	-684903.10
86+00	0.00	4814.73	0.00	8740.01	283028.10	976671.22	-693643.12
86+50	0.00	5673.29	0.00	10387.28	283028.10	987058.50	-704030.40
87+00	0.00	6791.44	0.00	11725.73	283028.10	998784.23	-715756.13
87+50	0.00	7279.43	0.00	11310.53	283028.10	1010094.76	-727066.65
88+00	0.00	6293.20	0.00	9253.91	283028.10	1019348.67	-736320.57
88+50	0.00	4811.50	0.00	6447.02	283028.10	1025795.69	-742767.58
89+00	0.00	2924.92	0.00	3529.54	283028.10	1029325.23	-746297.13
89+50	0.00	1310.53	327.00	1162.00	283355.10	1030487.23	-747132.13
90+00	321.05	83.87					

90+50	1739.38	0.00	2098.59	69.89	285453.69	1030557.13	-745103.44
91+00	2933.42	0.00	4759.33	0.00	290213.02	1030557.13	-740344.10
91+50	3866.32	0.00	6925.66	0.00	297138.68	1030557.13	-733418.45
92+00	4747.29	0.00	8773.12	0.00	305911.80	1030557.13	-724645.33
92+50	5504.75	0.00	10441.89	0.00	316353.69	1030557.13	-714203.44
93+00	6676.16	0.00	12406.48	0.00	328760.17	1030557.13	-701796.95
93+50	7577.72	0.00	14517.84	0.00	343278.01	1030557.13	-687279.11
94+00	7728.68	0.00	15589.85	0.00	358867.86	1030557.13	-671689.27
94+50	7176.74	0.00	15181.45	0.00	374049.31	1030557.13	-656507.82
95+00	6613.61	0.00	14045.73	0.00	388095.04	1030557.13	-642462.09
95+50	6268.09	0.00	13120.25	0.00	401215.29	1030557.13	-629341.84
96+00	7212.49	0.00	13730.22	0.00	414945.50	1030557.13	-615611.62
96+50	9191.69	0.00	16707.96	0.00	431653.47	1030557.13	-598903.66
97+00	11445.86	0.00	21019.73	0.00	452673.20	1030557.13	-577883.93
97+50	12658.84	0.00	24551.09	0.00	477224.28	1030557.13	-553332.84
98+00	12477.33	0.00	25601.66	0.00	502825.94	1030557.13	-527731.18
98+50	11944.71	0.00	24874.31	0.00	527700.25	1030557.13	-502856.88
99+00	12033.76	0.00	24422.52	0.00	552122.77	1030557.13	-478434.36
99+50	12240.02	0.00	24723.29	0.00	576846.06	1030557.13	-453711.07
100+00	12011.49	0.00	24700.62	0.00	601546.68	1030557.13	-429010.45
100+50	11769.46	0.00	24221.34	0.00	625768.02	1030557.13	-404789.10
101+00	11712.77	0.00	23917.09	0.00	649685.11	1030557.13	-380872.01
101+50	11888.80	0.00	24038.64	0.00	673723.76	1030557.13	-356833.37
102+00	12494.48	0.00	24834.83	0.00	698558.58	1030557.13	-331998.54
102+50	12609.18	0.00	25568.54	0.00	724127.12	1030557.13	-306430.00
103+00	12593.55	0.00	25669.44	0.00	749796.56	1030557.13	-280760.56
103+50	12752.67	0.00	25815.59	0.00	775612.16	1030557.13	-254944.97
104+00	12444.65	0.00	25663.94	0.00	801276.09	1030557.13	-229281.03
104+50	12155.66	0.00	25055.87	0.00	826331.96	1030557.13	-204225.16
105+00	11693.39	0.00	24290.70	0.00	850622.66	1030557.13	-179934.46
105+50	10972.16	0.00	23085.28	0.00	873707.95	1030557.13	-156849.18
106+00	9467.04	0.00	20817.71	0.00	894525.65	1030557.13	-136031.47
106+50	7319.33	0.00	17097.23	0.00	911622.88	1030557.13	-118934.25
107+00	5271.23	0.00	12823.71	0.00	924446.59	1030557.13	-106110.54
107+50	3587.82	0.00	9023.10	0.00	933469.69	1030557.13	-97087.44
108+00	2604.44	0.00	6306.93	0.00	939776.62	1030557.13	-90780.51
108+50	2172.72	0.00	4865.63	0.00	944642.24	1030557.13	-85914.88
109+00	2081.51	0.00	4333.02	0.00	948975.26	1030557.13	-81581.87
109+50	2128.59	0.00	4288.07	0.00	953263.33	1030557.13	-77293.79
110+00	1940.12	0.00	4144.05	0.00	957407.39	1030557.13	-73149.74
110+50	1617.77	0.00	3623.77	0.00	961031.16	1030557.13	-69525.97
111+00	1463.26	0.00	3138.09	0.00	964169.25	1030557.13	-66387.88
111+50	1551.39	0.00	3070.48	0.00	967239.73	1030557.13	-63317.40
112+00	1667.52	0.00	3278.52	0.00	970518.25	1030557.13	-60038.88
112+50	1571.05	0.00	3298.54	0.00	973816.79	1030557.13	-56740.34
113+00	1718.24	0.00	3350.20	0.00	977166.99	1030557.13	-53390.14
113+50	2383.09	0.00	4177.28	0.00	981344.27	1030557.13	-49212.86
			6779.52	0.00	988123.79	1030557.13	-42433.34

114+00	4273.16	0.00					
114+50	7272.49	0.00	11759.46	0.00	999883.25	1030557.13	-30673.87
115+00	10576.58	0.00	18179.60	0.00	1018062.86	1030557.13	-12494.27
115+50	13692.37	0.00	24718.37	0.00	1042781.23	1030557.13	12224.10
116+00	16876.09	0.00	31134.55	0.00	1073915.78	1030557.13	43358.65
116+50	20271.12	0.00	37835.13	0.00	1111750.90	1030557.13	81193.78
117+00	22947.37	0.00	44018.83	0.00	1155769.74	1030557.13	125212.61
117+50	25422.84	0.00	49265.95	0.00	1205035.69	1030557.13	174478.56
118+00	27200.50	0.00	53597.84	0.00	1258633.53	1030557.13	228076.41
118+50	28326.09	0.00	56554.86	0.00	1315188.40	1030557.13	284631.27
119+00	28629.14	0.00	58009.96	0.00	1373198.36	1030557.13	342641.23
119+50	27952.44	0.00	57629.39	0.00	1430827.75	1030557.13	400270.62
120+00	26679.16	0.00	55643.29	0.00	1486471.04	1030557.13	455913.92
120+50	24151.57	0.00	51772.04	0.00	1538243.08	1030557.13	507685.95
121+00	20500.36	0.00	45478.81	0.00	1583721.89	1030557.13	553164.77
121+50	15872.65	0.00	37046.59	0.00	1620768.48	1030557.13	590211.35
122+00	11954.72	0.00	28342.70	0.00	1649111.18	1030557.13	618554.05
122+50	9308.94	0.00	21657.43	0.00	1670768.61	1030557.13	640211.48
123+00	7502.91	0.00	17123.18	0.00	1687891.79	1030557.13	657334.66
123+50	5896.83	0.00	13647.88	0.00	1701539.67	1030557.13	670982.55
124+00	4397.76	0.00	10485.23	0.00	1712024.90	1030557.13	681467.77
124+50	3527.49	0.00	8072.01	0.00	1720096.91	1030557.13	689539.78
125+00	2789.90	0.00	6434.37	0.00	1726531.28	1030557.13	695974.16
125+50	1974.60	0.00	4852.73	0.00	1731384.02	1030557.13	700826.89
126+00	944.20	0.00	2972.86	0.00	1734356.87	1030557.13	703799.75
126+50	106.28	155.56	1069.94	129.64	1735426.81	1030686.76	704740.05
127+00	6.56	716.67	114.94	726.86	1735541.75	1031413.62	704128.12
127+50	163.76	445.02	173.48	968.08	1735715.22	1032381.70	703333.52
127+63.71	312.60	327.22	133.06	176.49	1735848.28	1032558.19	703290.09
128+00	832.27	97.86	846.20	257.16	1736694.48	1032815.36	703879.12
128+50	1827.55	0.00	2708.09	81.59	1739402.57	1032896.95	706505.62
129+00	2827.83	0.00	4738.33	0.00	1744140.91	1032896.95	711243.96
129+50	3909.85	0.00	6856.98	0.00	1750997.88	1032896.95	718100.93
130+00	4885.07	0.00	8953.25	0.00	1759951.14	1032896.95	727054.19
130+50	5226.00	0.00	10298.69	0.00	1770249.82	1032896.95	737352.87
131+00	5141.20	0.00	10565.55	0.00	1780815.37	1032896.95	747918.42
131+50	3914.59	0.00	9230.46	0.00	1790045.84	1032896.95	757148.89
131+63.71	3509.47	0.00	2075.12	0.00	1792120.96	1032896.95	759224.01
132+00	2399.66	0.00	4370.83	0.00	1796491.79	1032896.95	763594.83
132+50	981.84	0.00	3445.31	0.00	1799937.09	1032896.95	767040.14
133+00	385.30	135.42	1389.01	113.11	1801326.11	1033010.07	768316.04
133+50	289.70	508.85	683.60	539.46	1802009.71	1033549.53	768460.18
134+00	0.36	1213.72	293.43	1441.70	1802303.13	1034991.23	767311.90
134+50	0.00	2502.07	0.37	3105.73	1802303.50	1038096.96	764206.54
135+00	0.00	3855.47	0.00	5306.10	1802303.50	1043403.06	758900.44
135+50	0.00	5241.46	0.00	7585.41	1802303.50	1050988.48	751315.03
136+00	0.00	6638.75	0.00	9902.99	1802303.50	1060891.47	741412.04
136+50	0.00	7631.95	0.00	11895.56	1802303.50	1072787.03	729516.48

137+00	0.00	8107.66	0.00	13121.70	1802303.50	1085908.73	716394.77
137+50	0.00	8791.32	0.00	14089.04	1802303.50	1099997.77	702305.73
138+00	0.00	9671.59	0.00	15393.71	1802303.50	1115391.48	686912.02
138+50	0.00	9867.17	0.00	16295.76	1802303.50	1131687.25	670616.26
139+00	0.00	9898.63	0.00	16492.20	1802303.50	1148179.44	654124.06
139+50	0.00	10407.50	0.00	16948.81	1802303.50	1165128.26	637175.25
140+00	0.00	9884.81	0.00	16939.78	1802303.50	1182068.04	620235.46
140+40.58	0.00	8610.11	0.00	12527.82	1802303.50	1194595.86	607707.65
140+50	0.00	8294.38	0.00	2651.40	1802303.50	1197247.26	605056.24
141+00	0.00	7113.35	0.00	12823.02	1802303.50	1210070.28	592233.22
141+50	0.00	6200.24	0.00	11081.03	1802303.50	1221151.31	581152.20
142+00	0.00	5863.65	0.00	10043.11	1802303.50	1231194.42	571109.08
142+50	0.00	5733.97	0.00	9658.24	1802303.50	1240852.66	561450.84
143+00	0.00	5733.97	0.00	9552.84	1802303.50	1250405.50	551898.00
143+50	0.00	6066.33	0.00	9832.06	1802303.50	1260237.56	542065.94
144+00	0.00	6718.88	0.00	10654.41	1802303.50	1270891.97	531411.54
144+40.58	0.00	7163.55	0.00	9388.39	1802303.50	1280280.35	522023.15
144+50	0.00	7181.57	0.00	2253.26	1802303.50	1282533.62	519769.89
145+00	0.00	7039.05	0.00	11850.52	1802303.50	1294384.13	507919.37
145+50	0.00	6692.84	0.00	11443.24	1802303.50	1305827.37	496476.13
146+00	0.00	6321.21	0.00	10845.04	1802303.50	1316672.41	485631.09
146+50	0.00	6176.63	0.00	10414.87	1802303.50	1327087.28	475216.22
147+00	0.00	5869.21	0.00	10038.20	1802303.50	1337125.48	465178.02
147+50	0.00	5706.17	0.00	9646.15	1802303.50	1346771.63	455531.87
148+00	0.00	5458.18	0.00	9303.62	1802303.50	1356075.25	446228.25
148+50	0.00	5030.60	0.00	8740.65	1802303.50	1364815.90	437487.60
149+00	0.00	4645.34	0.00	8063.28	1802303.50	1372879.18	429424.32
149+50	0.00	4760.89	0.00	7838.52	1802303.50	1380717.70	421585.80
150+00	0.00	5078.87	0.00	8199.80	1802303.50	1388917.50	413386.00
150+50	0.00	4947.15	0.00	8355.02	1802303.50	1397272.52	405030.98
151+00	0.00	3593.60	0.00	7117.29	1802303.50	1404389.81	397913.69
151+50	0.00	1892.85	0.00	4572.04	1802303.50	1408961.85	393341.65
152+00	9.47	376.13	9.65	1890.82	1802313.15	1410852.66	391460.49
152+50	714.38	0.00	737.26	313.44	1803050.41	1411166.10	391884.31
153+00	1642.61	0.00	2400.63	0.00	1805451.05	1411166.10	394284.94
153+50	2093.40	0.00	3805.19	0.00	1809256.23	1411166.10	398090.13
154+00	2090.46	0.00	4261.34	0.00	1813517.57	1411166.10	402351.47
154+50	3505.75	0.00	5699.85	0.00	1819217.42	1411166.10	408051.32
155+00	3950.51	0.00	7594.34	0.00	1826811.76	1411166.10	415645.65
155+50	3954.84	0.00	8051.74	0.00	1834863.50	1411166.10	423697.40
156+00	3330.78	0.00	7420.54	0.00	1842284.05	1411166.10	431117.94
156+50	2589.71	0.00	6030.13	0.00	1848314.18	1411166.10	437148.07
157+00	2182.14	0.00	4860.21	0.00	1853174.39	1411166.10	442008.28
157+50	1685.38	0.00	3939.14	0.00	1857113.53	1411166.10	445947.42
158+00	1222.62	0.00	2961.85	0.00	1860075.38	1411166.10	448909.28
158+50	861.56	0.00	2122.77	0.00	1862198.15	1411166.10	451032.05
159+00	631.91	0.00	1521.13	0.00	1863719.28	1411166.10	452553.17
			979.31	59.20	1864698.58	1411225.30	453473.28

159+50	329.59	71.04						
160+00	434.18	242.02	777.92	260.88	1865476.50	1411486.19	453990.31	
160+50	821.30	91.56	1278.73	277.98	1866755.23	1411764.17	454991.07	
161+00	966.80	0.26	1821.21	76.52	1868576.45	1411840.68	456735.76	
161+50	580.01	1.10	1575.46	1.14	1870151.90	1411841.82	458310.08	
162+00	231.90	60.73	826.95	51.52	1870978.85	1411893.34	459085.51	
162+50	182.99	112.38	422.57	144.26	1871401.43	1412037.60	459363.83	
163+00	148.66	142.22	337.79	212.16	1871739.22	1412249.76	459489.46	
163+50	123.21	175.30	276.91	264.60	1872016.13	1412514.36	459501.76	
164+00	158.75	283.57	287.18	382.40	1872303.31	1412896.76	459406.55	
164+50	503.57	226.23	674.58	424.83	1872977.89	1413321.59	459656.30	
165+00	885.31	43.44	1414.59	224.73	1874392.49	1413546.32	460846.17	
165+50	861.27	0.00	1778.92	36.20	1876171.41	1413582.52	462588.89	
166+00	324.87	116.37	1208.11	96.97	1877379.52	1413679.50	463700.02	
166+50	169.82	462.82	503.85	482.66	1877883.37	1414162.15	463721.22	
167+00	42.91	1205.45	216.67	1390.23	1878100.04	1415552.38	462547.66	
167+50	20.98	2135.68	65.07	2784.27	1878165.11	1418336.65	459828.46	
168+00	0.41	2689.64	21.79	4021.09	1878186.90	1422357.74	455829.16	
168+50	0.00	2482.63	0.42	4310.23	1878187.32	1426667.97	451519.35	
169+00	0.00	2653.38	0.00	4280.02	1878187.32	1430947.99	447239.33	
169+50	0.00	2968.34	0.00	4684.77	1878187.32	1435632.76	442554.56	
170+00	0.00	3543.71	0.00	5426.71	1878187.32	1441059.47	437127.85	
170+50	0.00	4713.76	0.00	6881.23	1878187.32	1447940.70	430246.62	
171+00	0.00	6211.54	0.00	9104.42	1878187.32	1457045.11	421142.21	
171+50	0.00	7011.41	0.00	11019.12	1878187.32	1468064.24	410123.08	
172+00	0.00	7337.79	0.00	11957.66	1878187.32	1480021.90	398165.42	
172+50	0.00	7354.51	0.00	12243.58	1878187.32	1492265.48	385921.84	
173+00	0.00	6865.77	0.00	11850.24	1878187.32	1504115.72	374071.60	
173+50	0.00	6159.50	0.00	10854.39	1878187.32	1514970.11	363217.21	
173+81.57	0.00	5854.49	0.00	6321.49	1878187.32	1521291.60	356895.72	
174+00	0.00	5696.53	0.00	3547.51	1878187.32	1524839.11	353348.21	
174+50	0.00	5416.91	0.00	9251.84	1878187.32	1534090.95	344096.37	
175+00	0.00	5630.96	0.00	9180.35	1878187.32	1543271.30	334916.02	
175+50	0.00	5719.50	0.00	9422.62	1878187.32	1552693.92	325493.40	
176+00	0.00	5474.07	0.00	9292.69	1878187.32	1561986.61	316200.71	
176+50	0.00	4879.88	0.00	8604.25	1878187.32	1570590.86	307596.46	
177+00	0.00	3723.68	0.00	7159.21	1878187.32	1577750.07	300437.25	
177+50	0.00	3199.17	0.00	5761.39	1878187.32	1583511.46	294675.86	
177+81.57	0.00	3078.06	0.00	3300.41	1878187.32	1586811.87	291375.45	
178+00	0.00	2937.40	0.00	1849.96	1878187.32	1588661.83	289525.49	
178+04.53	0.00	2916.76	0.00	443.32	1878187.32	1589105.16	289082.16	
178+50	0.00	3029.93	0.00	4476.83	1878187.32	1593581.99	284605.33	
179+00	0.00	4064.93	0.00	5868.87	1878187.32	1599450.86	278736.46	
179+50	0.00	4414.23	0.00	7037.03	1878187.32	1606487.88	271699.44	
180+00	0.00	4112.34	0.00	7088.85	1878187.32	1613576.73	264610.59	
180+50	0.00	3609.64	0.00	6432.58	1878187.32	1620009.31	258178.01	
181+00	0.00	2960.19	0.00	5482.32	1878187.32	1625491.63	252695.69	
181+50	0.00	2232.00	0.00	4332.97	1878187.32	1629824.60	248362.72	

182+00	0.00	1320.17	0.00	2961.29	1878187.32	1632785.89	245401.43
182+04.53	0.00	1236.05	0.00	193.04	1878187.32	1632978.92	245208.40
182+50	0.69	389.27	0.64	1231.70	1878187.96	1634210.62	243977.34
183+00	592.77	2.43	604.45	326.42	1878792.42	1634537.04	244255.37
183+50	1367.14	0.00	1996.20	2.03	1880788.62	1634539.07	246249.55
184+00	1434.00	116.12	2853.01	96.77	1883641.63	1634635.83	249005.80
184+50	1514.29	0.00	3002.89	96.77	1886644.52	1634732.60	251911.92
185+00	2388.12	0.00	3974.68	0.00	1890619.20	1634732.60	255886.60
185+50	3809.18	0.00	6312.06	0.00	1896931.27	1634732.60	262198.67
186+00	4150.99	0.00	8107.58	0.00	1905038.85	1634732.60	270306.25
186+50	4806.60	0.00	9123.47	0.00	1914162.32	1634732.60	279429.72
187+00	5496.67	0.00	10494.07	0.00	1924656.39	1634732.60	289923.79
187+50	6129.58	0.00	11841.55	0.00	1936497.94	1634732.60	301765.34
188+00	7330.78	0.00	13709.63	0.00	1950207.56	1634732.60	315474.96
188+50	9780.62	0.00	17428.28	0.00	1967635.84	1634732.60	332903.24
189+00	12796.20	0.00	22994.91	0.00	1990630.75	1634732.60	355898.15
189+50	15757.57	0.00	29082.54	0.00	2019713.29	1634732.60	384980.70
190+00	18509.57	0.00	34901.72	0.00	2054615.01	1634732.60	419882.41
190+50	21312.37	0.00	40559.39	0.00	2095174.40	1634732.60	460441.80
191+00	23952.82	0.00	46103.44	0.00	2141277.84	1634732.60	506545.24
191+50	25079.82	0.00	49940.65	0.00	2191218.49	1634732.60	556485.89
192+00	26136.08	0.00	52164.33	0.00	2243382.82	1634732.60	608650.22
192+50	26963.53	0.00	54082.93	0.00	2297465.76	1634732.60	662733.16
193+00	27013.57	0.00	54976.68	0.00	2352442.43	1634732.60	717709.83
193+50	26140.14	0.00	54138.03	0.00	2406580.47	1634732.60	771847.87
194+00	25657.35	0.00	52756.70	0.00	2459337.17	1634732.60	824604.57
194+50	26378.99	0.00	52999.98	0.00	2512337.15	1634732.60	877604.55
195+00	26473.59	0.00	53831.33	0.00	2566168.48	1634732.60	931435.88
195+50	25390.58	0.00	52824.62	0.00	2618993.10	1634732.60	984260.50
196+00	23244.93	0.00	49536.17	0.00	2668529.27	1634732.60	1033796.67
196+50	19963.05	0.00	44008.13	0.00	2712537.40	1634732.60	1077804.80
197+00	17381.26	0.00	38035.88	0.00	2750573.28	1634732.60	1115840.68
197+50	15853.25	0.00	33849.97	0.00	2784423.25	1634732.60	1149690.65
198+00	14817.54	0.00	31238.77	0.00	2815662.02	1634732.60	1180929.42
198+50	13493.30	0.00	28835.12	0.00	2844497.14	1634732.60	1209764.54
199+00	11868.69	0.00	25831.66	0.00	2870328.80	1634732.60	1235596.20
199+50	10005.92	0.00	22279.70	0.00	2892608.50	1634732.60	1257875.90
200+00	8130.51	0.00	18472.30	0.00	2911080.79	1634732.60	1276348.19
200+50	6255.17	0.00	14652.09	0.00	2925732.88	1634732.60	1291000.28
201+00	4562.07	0.00	11017.57	0.00	2936750.45	1634732.60	1302017.85
201+50	3151.36	0.00	7856.28	0.00	2944606.73	1634732.60	1309874.13
202+00	3182.27	0.00	6450.93	0.00	2951057.66	1634732.60	1316325.06
202+50	3357.67	0.00	6661.05	0.00	2957718.71	1634732.60	1322986.11
203+00	3404.74	0.00	6887.64	0.00	2964606.34	1634732.60	1329873.74
203+50	3179.19	0.00	6705.85	0.00	2971312.19	1634732.60	1336579.59
204+00	2688.34	0.00	5976.19	0.00	2977288.38	1634732.60	1342555.78
204+50	1969.69	2.73	4744.30	2.27	2982032.67	1634734.87	1347297.80
			3234.86	131.75	2985267.53	1634866.63	1350400.90

205+00	1206.35	155.37						
205+50	468.48	528.75	1705.84	570.10	2986973.37	1635436.73	1351536.64	
206+00	6.19	1069.55	483.46	1331.91	2987456.84	1636768.64	1350688.19	
206+50	0.00	1874.19	6.31	2453.12	2987463.15	1639221.76	1348241.39	
207+00	0.00	2683.02	0.00	3797.68	2987463.15	1643019.43	1344443.71	
207+50	0.00	3931.87	0.00	5512.41	2987463.15	1648531.84	1338931.30	
208+00	0.00	5770.84	0.00	8085.59	2987463.15	1656617.43	1330845.71	
208+50	0.00	7714.68	0.00	11237.93	2987463.15	1667855.36	1319607.79	
209+00	0.00	7299.25	0.00	12511.60	2987463.15	1680366.96	1307096.18	
209+50	0.00	6976.01	0.00	11896.05	2987463.15	1692263.01	1295200.14	
210+00	0.00	6457.41	0.00	11194.51	2987463.15	1703457.52	1284005.62	
210+50	0.00	6206.58	0.00	10553.33	2987463.15	1714010.85	1273452.30	
211+00	0.00	6121.83	0.00	10273.68	2987463.15	1724284.53	1263178.62	
211+50	0.00	6079.74	0.00	10167.98	2987463.15	1734452.50	1253010.64	
212+00	0.00	5805.43	0.00	9904.31	2987463.15	1744356.82	1243106.33	
212+12.26	0.00	5687.04	0.00	2348.70	2987463.15	1746705.52	1240757.63	
212+50	0.00	5069.78	0.00	6765.53	2987463.15	1753471.04	1233992.10	
213+00	0.00	3864.79	0.00	7443.74	2987463.15	1760914.78	1226548.36	
213+50	0.00	2431.69	0.00	5243.38	2987463.15	1766158.16	1221304.99	
214+00	0.00	886.56	0.00	2761.56	2987463.15	1768919.71	1218543.43	
214+50	336.39	1.75	342.69	738.16	2987805.84	1769657.88	1218147.96	
215+00	977.19	0.00	1338.37	1.46	2989144.20	1769659.34	1219484.87	
215+50	925.63	0.00	1939.76	0.00	2991083.96	1769659.34	1221424.62	
216+00	552.51	82.33	1509.45	68.42	2992593.41	1769727.75	1222865.66	
216+12.26	447.66	124.65	250.76	42.05	2992844.17	1769769.80	1223074.37	
216+50	153.48	243.48	464.01	230.23	2993308.18	1770000.03	1223308.15	
217+00	8.96	595.08	165.82	696.38	2993473.99	1770696.41	1222777.58	
217+50	0.00	1290.29	9.13	1571.04	2993483.12	1772267.45	1221215.67	
218+00	0.00	2243.45	0.00	2949.93	2993483.12	1775217.38	1218265.74	
218+00.66	0.00	2257.74	0.00	49.71	2993483.12	1775267.09	1218216.03	
218+50	0.00	3442.86	0.00	4677.52	2993483.12	1779944.61	1213538.51	
219+00	0.00	4584.83	0.00	6675.21	2993483.12	1786619.82	1206863.30	
219+50	0.00	5419.75	0.00	8319.63	2993483.12	1794939.45	1198543.67	
220+00	0.00	5453.53	0.00	9045.16	2993483.12	1803984.61	1189498.52	
220+50	0.00	5470.12	0.00	9092.40	2993483.12	1813077.00	1180406.12	
221+00	0.00	5872.72	0.00	9445.70	2993483.12	1822522.71	1170960.41	
221+50	0.00	4737.98	0.00	8839.52	2993483.12	1831362.23	1162120.89	
222+00	0.00	4926.17	0.00	8052.94	2993483.12	1839415.18	1154067.95	
222+00.66	0.00	4945.18	0.00	108.78	2993483.12	1839523.96	1153959.16	
222+50	0.00	6625.98	0.00	9515.12	2993483.12	1849039.08	1144444.04	
223+00	0.00	8379.40	0.00	12504.48	2993483.12	1861543.56	1131939.56	
223+50	0.00	10598.43	0.00	15814.86	2993483.12	1877358.42	1116124.70	
224+00	0.00	13340.62	0.00	19949.21	2993483.12	1897307.63	1096175.49	
224+50	0.00	16764.50	0.00	25087.60	2993483.12	1922395.23	1071087.89	
225+00	0.00	20706.10	0.00	31225.50	2993483.12	1953620.73	1039862.39	
225+50	0.00	23946.77	0.00	37210.73	2993483.12	1990831.46	1002651.66	

226+00	0.00	26118.05	0.00	41720.68	2993483.12	2032552.15	960930.97
226+50	0.00	27602.71	0.00	44767.30	2993483.12	2077319.45	916163.67
227+00	0.00	28020.74	0.00	46352.87	2993483.12	2123672.32	869810.80
227+50	0.00	28194.20	0.00	46845.78	2993483.12	2170518.10	822965.02
228+00	0.00	28683.17	0.00	47397.81	2993483.12	2217915.91	775567.21
228+50	0.00	30819.91	0.00	49585.90	2993483.12	2267501.81	725981.31
229+00	0.00	32836.49	0.00	53047.00	2993483.12	2320548.81	672934.31
229+50	0.00	35534.82	0.00	56976.09	2993483.12	2377524.91	615958.22
230+00	0.00	38259.23	0.00	61495.05	2993483.12	2439019.95	554463.17
230+50	0.00	40720.98	0.00	65816.84	2993483.12	2504836.80	488646.33
231+00	0.00	42682.97	0.00	69503.29	2993483.12	2574340.09	419143.03
231+50	0.00	45325.15	0.00	73340.10	2993483.12	2647680.19	345802.94
232+00	0.00	49148.85	0.00	78728.33	2993483.12	2726408.52	267074.60
232+50	0.00	53786.42	0.00	85779.39	2993483.12	2812187.91	181295.21
233+00	0.00	56664.36	0.00	92042.32	2993483.12	2904230.23	89252.89
233+50	0.00	58668.06	0.00	96110.36	2993483.12	3000340.59	-6857.46
234+00	0.00	57073.85	0.00	96451.59	2993483.12	3096792.18	-103309.06
234+50	0.00	55604.97	0.00	93899.02	2993483.12	3190691.20	-197208.08
235+00	0.00	54941.75	0.00	92122.27	2993483.12	3282813.47	-289330.35
235+50	0.00	54669.07	0.00	91342.35	2993483.12	3374155.82	-380672.70
236+00	0.00	52903.07	0.00	89643.45	2993483.12	3463799.27	-470316.15
236+50	0.00	49151.56	0.00	85045.53	2993483.12	3548844.80	-555361.68
237+00	0.00	43535.96	0.00	77239.60	2993483.12	3626084.40	-632601.28
237+50	0.00	36770.96	0.00	66922.44	2993483.12	3693006.84	-699523.72
238+00	0.00	29887.16	0.00	55548.44	2993483.12	3748555.28	-755072.16
238+50	0.00	22688.90	0.00	43813.39	2993483.12	3792368.67	-798885.54
239+00	0.00	16531.77	0.00	32683.89	2993483.12	3825052.56	-831569.44
239+50	0.00	11405.41	0.00	23280.99	2993483.12	3848333.55	-854850.43
240+00	0.00	7300.21	0.00	15588.02	2993483.12	3863921.57	-870438.45
240+50	0.00	4099.82	0.00	9500.02	2993483.12	3873421.60	-879938.47
241+00	93.23	1599.88	94.96	4749.74	2993578.08	3878171.34	-884593.26
241+50	968.18	325.20	1081.06	1604.23	2994659.14	3879775.57	-885116.42
242+00	2610.22	0.00	3644.66	271.00	2998303.81	3880046.56	-881742.75
242+50	4240.24	0.00	6977.32	0.00	3005281.13	3880046.56	-874765.44
243+00	5393.23	0.00	9811.86	0.00	3015092.99	3880046.56	-864953.57
243+50	5699.14	0.00	11297.79	0.00	3026390.78	3880046.56	-853655.79
244+00	5326.06	0.00	11229.37	0.00	3037620.15	3880046.56	-842426.42
244+50	4217.37	0.00	9720.16	0.00	3047340.31	3880046.56	-832706.25
245+00	2905.62	95.55	7254.90	79.63	3054595.21	3880126.19	-825530.98
245+50	1783.07	809.68	4775.52	754.36	3059370.73	3880880.54	-821509.82
246+00	851.41	2071.78	2683.27	2401.21	3062054.00	3883281.76	-821227.76
246+50	947.52	3081.40	1832.25	4294.32	3063886.25	3887576.08	-823689.83
247+00	1976.93	3387.16	2978.61	5390.47	3066864.86	3892966.55	-826101.69
247+50	2498.71	3233.32	4558.52	5517.06	3071423.37	3898483.61	-827060.24
248+00	2296.30	2620.44	4883.80	4878.13	3076307.17	3903361.74	-827054.56
248+50	1454.38	1670.55	3820.14	3575.82	3080127.31	3906937.56	-826810.25
248+85.54	724.78	1502.51	1577.42	1879.24	3081704.73	3908816.81	-827112.08

Segment F2

Segment: F2

Station	END AREA VOLUME LISTING WITH CURVE CORRECTION		Cut 1.1000		Fill 0.9000		Mass Ordinate
	Cut Area (sqft)	Fill Area (sqft)	Cut Volume (yds)	Fill Volume (yds)	Cut Tot Vol (yds)	Fill Tot Vol (yds)	
0+00	0.04	572.09					
0+50	312.60	119.93	318.42	576.68	318.42	576.68	-258.26
1+00	886.68	0.00	1221.49	99.94	1539.91	676.62	863.29
1+50	1308.24	0.00	2235.56	0.00	3775.48	676.62	3098.86
2+00	1445.21	0.00	2804.43	0.00	6579.91	676.62	5903.29
2+50	1702.26	0.00	3205.75	0.00	9785.66	676.62	9109.04
3+00	1999.31	0.00	3770.12	0.00	13555.78	676.62	12879.16
3+50	1440.39	0.00	3503.40	0.00	17059.18	676.62	16382.56
4+00	1203.62	63.24	2692.97	52.70	19752.15	729.32	19022.83
4+50	1460.54	49.27	2713.49	93.76	22465.64	823.08	21642.57
5+00	2506.24	0.00	4040.24	41.06	26505.88	864.13	25641.75
5+50	3200.41	0.00	5812.33	0.00	32318.21	864.13	31454.08
6+00	3373.46	0.00	6695.61	0.00	39013.82	864.13	38149.69
6+50	3444.10	0.00	6943.82	0.00	45957.64	864.13	45093.51
7+00	3942.92	0.00	7523.82	0.00	53481.46	864.13	52617.33
7+50	5224.88	0.00	9337.58	0.00	62819.04	864.13	61954.90
8+00	6201.34	0.00	11637.82	0.00	74456.85	864.13	73592.72
8+50	5619.61	0.00	12039.86	0.00	86496.71	864.13	85632.58
9+00	3808.37	0.00	9602.57	0.00	96099.28	864.13	95235.15
9+50	3483.57	0.00	7426.98	0.00	103526.26	864.13	102662.13
10+00	3907.47	0.00	7527.91	0.00	111054.17	864.13	110190.04
10+50	3907.47	0.00	7680.42	0.00	118734.60	864.13	117870.46
11+00	3633.31	0.00	6566.56	0.00	125301.15	864.13	124437.02
11+50	2813.86	0.00	5971.16	0.00	131272.32	864.13	130408.18
12+00	3048.74	0.00	7773.38	0.00	139045.69	864.13	138181.56
12+50	4583.30	0.00	7399.72	0.00	146445.42	864.13	145581.28
13+00	2681.88	0.00	4753.16	0.00	151198.58	864.13	150334.45
13+50	1984.86	0.00	3883.25	0.00	155081.83	864.13	154217.69
14+00	1827.78	0.00	2942.14	0.00	158023.97	864.13	157159.84
14+50	1060.87	0.00	1347.53	10.48	159371.50	874.62	158496.88
15+00	262.16	12.58	334.43	166.18	159705.93	1040.79	158665.14
15+50	66.19	186.83	275.60	244.14	159981.53	1284.94	158696.59
16+00	204.40	106.14	944.40	112.66	160925.93	1397.60	159528.33
16+36.66	722.84	29.05	1463.19	40.66	162389.12	1438.26	160950.86
16+50	1236.74	37.50	720.91	17.69	163110.02	1455.95	161654.08
17+00	1414.93	42.04	4133.97	35.01	167243.99	1490.96	165753.03
17+50	2641.31	0.00	8176.62	0.00	175420.61	1490.96	173929.65
18+00	5379.98	0.00	12375.96	0.00	187796.57	1490.96	186305.61
18+50	6766.53	0.00	14154.85	0.00	201951.42	1490.96	200460.46
19+00	7130.45	0.00	13875.06	0.00	215826.48	1490.96	214335.52
19+50	6491.40	0.00	12818.23	0.00	228644.71	1490.96	227153.74
20+00	6091.02	0.00	12709.39	0.00	241354.10	1490.96	239863.14
20+36.66	6386.30	0.00	9983.80	0.00	251337.89	1490.96	249846.93

20+50	7203.37	0.00	3857.14	0.00	255195.03	1490.96	253704.07
21+00	7401.99	0.00	14877.05	0.00	270072.08	1490.96	268581.12
21+50	6953.04	0.00	14622.09	0.00	284694.16	1490.96	283203.20
22+00	5954.20	0.00	13151.38	0.00	297845.54	1490.96	296354.58
22+12.38	5715.79	0.00	2946.31	0.00	300791.85	1490.96	299300.89
22+50	5044.57	0.00	8231.82	0.00	309023.67	1490.96	307532.71
23+00	4498.04	0.00	9697.04	0.00	318720.71	1490.96	317229.75
23+50	5290.43	0.00	9945.79	0.00	328666.50	1490.96	327175.54
24+00	6337.87	0.00	11816.17	0.00	340482.67	1490.96	338991.71
24+50	7005.92	0.00	13561.35	0.00	354044.02	1490.96	352553.06
25+00	7084.77	0.00	14324.44	0.00	368368.46	1490.96	366877.50
25+50	6471.58	0.00	13788.53	0.00	382157.00	1490.96	380666.04
26+00	5221.91	0.00	11902.76	0.00	394059.76	1490.96	392568.80
26+12.38	4875.66	0.00	2546.96	0.00	396606.72	1490.96	395115.76
26+50	3837.26	0.00	6676.34	0.00	403283.06	1490.96	401792.10
27+00	2819.35	0.00	6779.87	0.00	410062.94	1490.96	408571.98
27+50	2356.04	0.00	5271.23	0.00	415334.16	1490.96	413843.20
28+00	2101.32	0.00	4539.91	0.00	419874.08	1490.96	418383.12
28+50	495.95	0.00	2645.37	0.00	422519.45	1490.96	421028.49
29+00	0.00	1135.61	505.14	946.35	423024.59	2437.31	420587.28
29+50	0.00	2723.08	0.00	3215.57	423024.59	5652.88	417371.71
30+00	0.00	3633.42	0.00	5297.08	423024.59	10949.96	412074.63
30+50	0.00	3244.33	0.00	5731.46	423024.59	16681.42	406343.17
31+00	0.00	1954.53	0.00	4332.38	423024.59	21013.81	402010.78
31+50	0.00	1208.61	0.00	2635.95	423024.59	23649.75	399374.83
32+00	0.00	1253.59	0.00	2051.83	423024.59	25701.59	397323.00
32+50	0.00	1818.20	0.00	2559.82	423024.59	28261.41	394763.18
33+00	0.00	2514.81	0.00	3610.84	423024.59	31872.25	391152.34
33+50	0.00	3216.03	0.00	4775.70	423024.59	36647.94	386376.64
34+00	0.00	3869.83	0.00	5904.88	423024.59	42552.83	380471.76
34+50	0.00	5075.41	0.00	7454.37	423024.59	50007.19	373017.40
35+00	0.00	7001.24	0.00	10063.87	423024.59	60071.06	362953.52
35+50	0.00	7364.39	0.00	11971.35	423024.59	72042.42	350982.17
36+00	0.00	7399.54	0.00	12303.28	423024.59	84345.69	338678.89
36+50	0.00	7490.00	0.00	12407.95	423024.59	96753.65	326270.94
37+00	0.00	7790.85	0.00	12734.05	423024.59	109487.69	313536.90
37+50	0.00	7626.38	0.00	12847.69	423024.59	122335.38	300689.20
38+00	0.00	7079.06	0.00	12254.53	423024.59	134589.92	288434.67
38+50	0.00	6029.58	0.00	10923.87	423024.59	145513.79	277510.80
39+00	0.00	4372.68	0.00	8668.56	423024.59	154182.35	268842.24
39+50	0.00	2542.97	0.00	5763.04	423024.59	159945.39	263079.20
40+00	0.00	1209.05	0.00	3126.68	423024.59	163072.07	259952.52
40+50	0.77	474.41	0.78	1402.88	423025.37	164474.95	258550.42
41+00	2.91	443.14	3.74	764.63	423029.11	165239.57	257789.54
41+50	0.00	586.83	2.96	858.31	423032.07	166097.88	256934.19
42+00	0.00	835.63	0.00	1185.39	423032.07	167283.27	255748.80
42+50	0.00	1159.59	0.00	1662.69	423032.07	168945.96	254086.11
			0.00	1843.26	423032.07	170789.22	252242.85

43+00	0.00	1052.32						
43+50	0.00	1084.17	0.00	1780.41	423032.07	172569.63	250462.44	
44+00	0.00	1621.65	0.00	2254.85	423032.07	174824.48	248207.59	
44+50	0.00	2278.31	0.00	3249.97	423032.07	178074.46	244957.61	
45+00	0.00	2543.74	0.00	4018.38	423032.07	182092.83	240939.24	
45+50	0.00	2399.52	0.00	4119.38	423032.07	186212.21	236819.85	
46+00	0.00	2559.16	0.00	4132.24	423032.07	190344.45	232687.62	
46+50	0.00	2812.72	0.00	4476.56	423032.07	194821.02	228211.05	
47+00	0.00	2954.51	0.00	4806.02	423032.07	199627.04	223405.03	
47+50	0.00	2995.98	0.00	4958.75	423032.07	204585.79	218446.28	
48+00	0.00	2458.74	0.00	4545.60	423032.07	209131.38	213900.69	
48+50	0.00	1414.17	0.00	3227.42	423032.07	212358.80	210673.26	
49+00	42.91	455.43	43.71	1558.00	423075.78	213916.80	209158.97	
49+50	257.61	689.48	306.09	954.09	423381.87	214870.89	208510.98	
50+00	93.25	912.89	357.36	1335.31	423739.23	216206.20	207533.03	
50+50	0.00	1805.20	94.98	2265.08	423834.20	218471.27	205362.93	
51+00	0.00	3283.43	0.00	4240.53	423834.20	222711.80	201122.41	
51+50	0.00	2891.85	0.00	5146.07	423834.20	227857.86	195976.34	
52+00	0.00	2338.55	0.00	4358.67	423834.20	232216.53	191617.67	
52+50	0.00	2054.11	0.00	3660.55	423834.20	235877.08	187957.12	
53+00	0.00	1800.16	0.00	3211.89	423834.20	239088.97	184745.23	
53+50	0.00	2447.95	0.00	3540.09	423834.20	242629.06	181205.14	
54+00	0.00	3558.28	0.00	5005.20	423834.20	247634.26	176199.95	
54+50	0.00	4734.61	0.00	6910.74	423834.20	254545.00	169289.21	
55+00	0.00	5411.48	0.00	8455.07	423834.20	263000.07	160834.13	
55+50	0.00	5419.47	0.00	9025.79	423834.20	272025.86	151808.34	
56+00	0.00	4743.08	0.00	8468.79	423834.20	280494.66	143339.55	
56+50	0.00	3107.03	0.00	6541.76	423834.20	287036.41	136797.79	
57+00	0.00	3332.98	0.00	5366.68	423834.20	292403.09	131431.11	
57+50	0.00	4524.19	0.00	6547.64	423834.20	298950.73	124883.47	
58+00	0.00	5462.06	0.00	8321.88	423834.20	307272.61	116561.59	
58+50	0.00	4449.47	0.00	8259.62	423834.20	315532.23	108301.98	
59+00	0.00	3198.76	0.00	6373.53	423834.20	321905.76	101928.45	
59+50	0.00	1741.79	0.00	4117.13	423834.20	326022.89	97811.32	
60+00	60.64	443.97	61.77	1821.47	423895.97	327844.36	96051.61	
60+50	463.37	68.49	533.71	427.06	424429.68	328271.41	96158.27	
61+00	632.41	0.00	1116.07	57.08	425545.75	328328.49	97217.26	
61+50	656.35	0.00	1312.63	0.00	426858.38	328328.49	98529.89	
62+00	602.95	0.00	1282.63	0.00	428141.01	328328.49	99812.52	
62+50	558.80	0.15	1183.26	0.12	429324.27	328328.62	100995.65	
63+00	564.00	12.57	1143.59	10.60	430467.86	328339.22	102128.64	
63+50	340.85	122.41	921.61	112.49	431389.47	328451.70	102937.76	
64+00	89.33	173.59	438.15	246.67	431827.61	328698.38	103129.24	
64+50	0.00	276.46	90.99	375.05	431918.60	329073.42	102845.18	
65+00	0.00	811.19	0.00	906.38	431918.60	329979.80	101938.80	
65+50	0.00	1612.01	0.00	2019.34	431918.60	331999.14	99919.46	
66+00	0.00	2272.38	0.00	3237.00	431918.60	335236.14	96682.46	
66+50	0.00	2463.38	0.00	3946.47	431918.60	339182.61	92736.00	

67+00	0.00	2261.29	0.00	3937.23	431918.60	343119.83	88798.77
67+50	0.00	2125.64	0.00	3655.77	431918.60	346775.60	85143.00
68+00	0.00	1800.94	0.00	3272.15	431918.60	350047.75	81870.85
68+50	0.00	1642.57	0.00	2869.59	431918.60	352917.34	79001.26
69+00	0.00	1821.51	0.00	2886.73	431918.60	355804.08	76114.53
69+50	0.00	1951.70	0.00	3144.34	431918.60	358948.42	72970.18
70+00	0.00	1844.01	0.00	3163.09	431918.60	362111.51	69807.09
70+50	0.00	2374.44	0.00	3515.38	431918.60	365626.89	66291.71
71+00	0.00	3780.95	0.00	5129.50	431918.60	370756.38	61162.22
71+50	0.00	5822.75	0.00	8003.09	431918.60	378759.47	53159.13
71+53.61	0.00	5959.91	0.00	709.34	431918.60	379468.81	52449.79
72+00	0.00	7393.70	0.00	10323.87	431918.60	389792.68	42125.92
72+50	0.00	7893.90	0.00	12741.99	431918.60	402534.67	29383.93
73+00	0.00	7055.27	0.00	12462.12	431918.60	414996.79	16921.81
73+50	0.00	5719.69	0.00	10648.22	431918.60	425645.01	6273.59
74+00	0.00	4749.43	0.00	8722.24	431918.60	434367.24	-2448.64
74+50	0.00	4454.15	0.00	7657.95	431918.60	442025.19	-10106.59
75+00	0.00	4351.97	0.00	7309.86	431918.60	449335.05	-17416.45
75+50	0.00	3857.56	0.00	6793.93	431918.60	456128.98	-24210.38
75+53.61	0.00	3881.15	0.00	461.85	431918.60	456590.83	-24672.23
76+00	0.00	4163.91	0.00	6167.90	431918.60	462758.73	-30840.13
76+50	0.00	3767.09	0.00	6546.41	431918.60	469305.14	-37386.54
77+00	0.00	3237.53	0.00	5765.95	431918.60	475071.09	-43152.49
77+50	0.00	3429.25	0.00	5491.50	431918.60	480562.59	-48643.99
78+00	0.00	3289.96	0.00	5550.17	431918.60	486112.76	-54194.16
78+50	0.00	3570.93	0.00	5673.80	431918.60	491786.56	-59867.95
79+00	0.00	3969.87	0.00	6237.47	431918.60	498024.03	-66105.43
79+50	0.00	3642.12	0.00	6285.57	431918.60	504309.59	-72390.99
80+00	0.00	3166.30	0.00	5614.09	431918.60	509923.68	-78005.08
80+50	0.00	2627.24	0.00	4783.85	431918.60	514707.53	-82788.93
81+00	0.00	1990.12	0.00	3818.65	431918.60	518526.18	-86607.58
81+50	0.00	1528.19	0.00	2912.27	431918.60	521438.45	-89519.85
82+00	0.00	1084.28	0.00	2166.11	431918.60	523604.56	-91685.96
82+50	9.66	859.56	9.83	1615.09	431928.43	525219.65	-93291.22
82+98.62	0.00	871.40	9.56	1400.43	431937.99	526620.08	-94682.09
83+00	0.00	877.01	0.00	40.26	431937.99	526660.34	-94722.35
83+50	0.00	1085.67	0.00	1636.34	431937.99	528296.68	-96358.69
84+00	0.00	1129.98	0.00	1845.19	431937.99	530141.87	-98203.87
84+50	0.00	957.66	0.00	1737.68	431937.99	531879.55	-99941.56
85+00	0.00	575.82	0.00	1276.62	431937.99	533156.17	-101218.18
85+50	83.17	119.66	84.68	578.83	432022.67	533734.99	-101712.33
86+00	605.48	0.00	699.64	99.66	432722.30	533834.65	-101112.35
86+50	1030.84	6.11	1661.34	5.10	434383.64	533839.75	-99456.10
86+98.62	774.54	0.00	1786.13	4.95	436169.78	533844.70	-97674.92
87+00	763.03	0.00	43.23	0.00	436213.00	533844.70	-97631.70
87+50	257.61	59.61	1039.55	49.67	437252.55	533894.37	-96641.82
88+00	0.00	864.03	262.38	769.70	437514.93	534664.07	-97149.14
			0.00	2030.11	437514.93	536694.18	-99179.25

88+50	0.00	1572.11		0.00	2688.65	437514.93	539382.83	-101867.90
89+00	0.00	1654.27		0.00	2644.31	437514.93	542027.15	-104512.22
89+50	0.00	1518.91		0.00	2350.71	437514.93	544377.85	-106862.92
90+00	0.00	1301.94		0.00	1965.30	437514.93	546343.15	-108828.22
90+50	0.00	1056.42		20.37	1401.66	437535.30	547744.82	-110209.52
91+00	20.00	625.58		297.81	690.64	437833.11	548435.45	-110602.34
91+50	272.40	203.18		1020.04	200.19	438853.15	548635.64	-109782.49
92+00	729.09	37.05		1787.84	30.87	440640.99	548666.51	-108025.52
92+50	1026.24	0.00		2009.32	0.00	442650.31	548666.51	-106016.20
93+00	946.55	0.00		1402.72	0.00	444053.03	548666.51	-104613.48
93+50	430.67	0.00		487.72	154.28	444540.76	548820.79	-104280.04
94+00	48.19	185.13		49.10	604.96	444589.85	549425.76	-104835.90
94+50	0.02	540.82		0.02	1161.63	444589.88	550587.39	-105997.51
95+00	0.00	853.14		0.00	1405.99	444589.88	551993.38	-107403.50
95+50	0.00	834.05		3.72	1130.10	444593.59	553123.48	-108529.88
96+00	3.65	522.07		155.66	558.64	444749.26	553682.11	-108932.86
96+50	149.18	148.29		629.49	164.46	445378.75	553846.58	-108467.82
97+00	468.86	49.06		783.20	41.19	446161.95	553887.77	-107725.82
97+50	300.09	0.37		406.42	77.50	446568.37	553965.26	-107396.89
98+00	98.94	92.62		100.77	641.58	446669.15	554606.84	-107937.69
98+50	0.00	677.27		0.00	1560.11	446669.15	556166.95	-109497.80
99+00	0.00	1194.86		0.00	2058.86	446669.15	558225.81	-111556.66
99+50	0.00	1275.77		31.90	1767.38	446701.05	559993.19	-113292.14
100+00	31.32	845.09		181.19	979.15	446882.24	560972.34	-114090.10
100+50	146.57	329.89		345.94	490.22	447228.18	561462.56	-114234.38
101+00	193.08	258.37		208.89	670.62	447437.07	562133.18	-114696.11
101+50	12.01	546.37		66.93	967.11	447504.01	563100.29	-115596.28
102+00	53.71	614.16		304.97	818.93	447808.97	563919.22	-116110.25
102+50	245.71	368.56		417.95	474.47	448226.93	564393.69	-116166.77
103+00	164.64	200.80		169.87	696.96	448396.80	565090.65	-116693.86
103+50	2.14	635.55		8.22	1425.81	448405.02	566516.47	-118111.45
104+00	5.93	1075.43		38.88	1610.34	448443.91	568126.80	-119682.90
104+50	32.24	856.97		92.46	1119.10	448536.36	569245.90	-120709.54
105+00	58.53	485.94		118.75	727.40	448655.11	569973.30	-121318.19
105+50	58.06	386.93		121.08	838.23	448776.20	570811.53	-122035.33
106+00	60.82	618.94		147.66	1159.49	448923.86	571971.02	-123047.16
106+50	84.15	772.45		171.19	1126.49	449095.05	573097.52	-124002.47
107+00	83.92	579.35		92.08	998.43	449187.13	574095.95	-124908.82
107+50	6.48	618.77		6.60	1140.09	449193.73	575236.04	-126042.31
108+00	0.00	749.34		21.90	879.66	449215.64	576115.70	-126900.06
108+50	21.51	306.25		21.90	786.53	449237.54	576902.23	-127664.69
109+00	0.00	637.58		0.00	1379.23	449237.54	578281.46	-129043.92
109+50	0.00	1017.50		0.00	1776.72	449237.54	580058.18	-130820.64
110+00	0.00	1114.57		0.00	1951.58	449237.54	582009.76	-132772.22
110+50	0.00	1227.32		0.00	2084.77	449237.54	584094.54	-134857.00
111+00	0.00	1274.40		0.00	1858.42	449237.54	585952.95	-136715.41
111+50	0.00	955.70		0.00	1678.90	449237.54	587631.85	-138394.31
112+00	0.00	1058.98						

112+50	0.00	1432.88	0.00	2076.55	449237.54	589708.40	-140470.86
113+00	0.00	1069.84	0.00	2085.60	449237.54	591794.00	-142556.46
113+50	0.00	494.32	0.00	1303.47	449237.54	593097.47	-143859.93
114+00	42.01	175.73	42.79	558.38	449280.33	593655.84	-144375.51
114+50	9.08	689.38	52.05	720.92	449332.38	594376.77	-145044.39
115+00	0.00	1680.35	9.25	1974.77	449341.63	596351.54	-147009.91
115+50	0.00	2568.40	0.00	3540.63	449341.63	599892.17	-150550.54
116+00	0.00	2757.35	0.00	4438.13	449341.63	604330.30	-154988.67
116+50	0.00	2234.36	0.00	4159.76	449341.63	608490.06	-159148.43
117+00	31.23	1363.02	31.80	2997.82	449373.43	611487.87	-162114.44
117+50	36.43	886.38	68.90	1874.50	449442.34	613362.37	-163920.03
118+00	0.00	1094.72	37.10	1650.92	449479.44	615013.29	-165533.85
118+50	0.00	1977.16	0.00	2559.90	449479.44	617573.19	-168093.75
119+00	0.00	4387.79	0.00	5304.12	449479.44	622877.31	-173397.87
119+50	0.00	6797.54	0.00	9321.11	449479.44	632198.42	-182718.98
120+00	0.00	7897.62	0.00	12245.97	449479.44	644444.39	-194964.96
120+50	0.00	7858.44	0.00	13130.05	449479.44	657574.45	-208095.01
121+00	0.00	6916.03	0.00	12312.06	449479.44	669886.51	-220407.07
121+50	0.00	5744.41	0.00	10550.36	449479.44	680436.87	-230957.44
121+90.54	0.00	5051.63	0.00	7294.42	449479.44	687731.30	-238251.86
122+00	0.00	4941.81	0.00	1575.86	449479.44	689307.15	-239827.72
122+50	0.00	4647.25	0.00	7996.24	449479.44	697303.39	-247823.95
123+00	0.00	5278.13	0.00	8285.47	449479.44	705588.87	-256109.43
123+50	0.00	6316.69	0.00	9684.45	449479.44	715273.31	-265793.88
124+00	0.00	7076.69	0.00	11187.61	449479.44	726460.92	-276981.49
124+50	0.00	7708.69	0.00	12349.98	449479.44	738810.90	-289331.47
125+00	0.00	8614.05	0.00	13638.60	449479.44	752449.50	-302970.06
125+50	0.00	9218.19	0.00	14918.70	449479.44	767368.20	-317888.76
125+90.54	0.00	9412.66	0.00	12654.04	449479.44	780022.24	-330542.80
126+00	0.00	9373.36	0.00	2978.49	449479.44	783000.74	-333521.30
126+50	0.00	9132.62	0.00	15500.25	449479.44	798500.99	-349021.55
127+00	0.00	9559.78	0.00	15644.12	449479.44	814145.11	-364665.67
127+50	0.00	10151.47	0.00	16488.17	449479.44	830633.27	-381153.84
128+00	0.00	10540.01	0.00	17307.81	449479.44	847941.08	-398461.64
128+50	0.00	9281.67	0.00	16568.25	449479.44	864509.33	-415029.89
129+00	0.00	8614.96	0.00	14954.41	449479.44	879463.74	-429984.30
129+20.29	0.00	9161.04	0.00	6034.69	449479.44	885498.43	-436018.99
129+50	0.00	10632.55	0.00	9755.53	449479.44	895253.95	-445774.51
130+00	0.00	12531.12	0.00	19221.30	449479.44	914475.25	-464995.81
130+50	0.00	13713.14	0.00	21782.37	449479.44	936257.62	-486778.18
131+00	0.00	14351.16	0.00	23288.56	449479.44	959546.18	-510066.74
131+50	0.00	15048.42	0.00	24409.34	449479.44	983955.52	-534476.08
132+00	0.00	15841.32	0.00	25681.19	449479.44	1009636.71	-560157.27
132+50	0.00	15544.83	0.00	26120.84	449479.44	1035757.55	-586278.11
133+00	0.00	16599.65	0.00	26766.74	449479.44	1062524.29	-613044.85
133+20.29	0.00	17568.35	0.00	11553.07	449479.44	1074077.35	-624597.92
133+50	0.00	19147.72	0.00	18179.57	449479.44	1092256.92	-642777.48
			0.00	33222.55	449479.44	1125479.47	-676000.03

134+00	0.00	20719.34	0.00	34485.79	449479.44	1159965.26	-710485.82
134+50	0.00	20663.61	0.00	33516.06	449479.44	1193481.32	-744001.88
135+00	0.00	19555.66	0.00	32506.97	449479.44	1225988.29	-776508.86
135+50	0.00	19452.71	0.00	32316.62	449479.44	1258304.91	-808825.47
136+00	0.00	19327.23	0.00	31819.66	449479.44	1290124.57	-840645.13
136+50	0.00	18856.36	0.00	31888.18	449479.44	1322012.75	-872533.31
137+00	0.00	19409.46	0.00	32342.25	449479.44	1354355.00	-904875.56
137+50	0.00	19401.24	0.00	31847.54	449479.44	1386202.54	-936723.10
138+00	0.00	18815.80	0.00	29973.31	449479.44	1416175.84	-966696.41
138+50	0.00	17152.16	0.00	26433.04	449479.44	1442608.89	-993129.45
139+00	0.00	14567.49	0.00	22211.59	449479.44	1464820.47	-1015341.04
139+50	0.00	12086.42	0.00	18698.11	449479.44	1483518.59	-1034039.15
140+00	0.00	10351.31	0.00	17183.44	449479.44	1500702.02	-1051222.59
140+50	0.00	10268.81	0.00	18516.80	449479.44	1519218.82	-1069739.38
141+00	0.00	11951.35	0.00	21761.13	449479.44	1540979.95	-1091500.52
141+50	0.00	14162.01	0.00	25699.49	449479.44	1566679.44	-1117200.00
142+00	0.00	16677.37	0.00	29076.55	449479.44	1595755.99	-1146276.56
142+50	0.00	18214.49	0.00	32800.42	449479.44	1628556.41	-1179076.97
143+00	0.00	21146.01	0.00	37558.17	449479.44	1666114.57	-1216635.14
143+50	0.00	23923.78	0.00	40727.13	449479.44	1706841.70	-1257362.26
144+00	0.00	24948.77	0.00	40994.01	449479.44	1747835.71	-1298356.27
144+50	0.00	24244.05	0.00	38731.73	449479.44	1786567.44	-1337088.00
145+00	0.00	22234.03	0.00	36472.90	449479.44	1823040.34	-1373560.90
145+50	0.00	21533.46	0.00	35906.66	449479.44	1858947.00	-1409467.56
146+00	0.00	21554.54	0.00	35694.90	449479.44	1894641.90	-1445162.46
146+50	0.00	21279.34	0.00	35301.92	449479.44	1929943.82	-1480464.38
147+00	0.00	21082.97	0.00	34586.03	449479.44	1964529.85	-1515050.41
147+50	0.00	20420.26	0.00	32874.59	449479.44	1997404.44	-1547925.00
148+00	0.00	19029.24	0.00	29554.78	449479.44	2026959.22	-1577479.78
148+50	0.00	16436.49	0.00	24405.80	449479.44	2051365.01	-1601885.57
149+00	0.00	12850.46	0.00	18673.60	449479.44	2070038.62	-1620559.18
149+50	0.00	9557.86	0.00	13561.42	449479.44	2083600.03	-1634120.59
150+00	0.00	6715.83	0.00	9079.91	449479.44	2092679.94	-1643200.50
150+50	0.00	4180.06	187.54	6491.45	449666.98	2099171.39	-1649504.41
151+00	184.13	3609.68	405.30	6269.07	450072.27	2105440.46	-1655368.19
151+50	213.80	3913.21	599.13	7323.46	450671.40	2112763.92	-1662092.52
152+00	374.44	4874.95	383.80	9316.64	451055.20	2122080.56	-1671025.36
152+50	2.38	6305.02	2.43	10731.23	451057.63	2132811.79	-1681754.17
153+00	0.00	6572.46	0.00	10253.98	451057.63	2143065.77	-1692008.14
153+50	0.00	5732.31	2.57	8314.33	451060.19	2151380.10	-1700319.90
154+00	2.52	4244.89	378.63	5774.70	451438.82	2157154.80	-1705715.98
154+50	369.23	2684.76	1707.83	3431.43	453146.66	2160586.23	-1707439.57
155+00	1307.56	1432.96	4529.11	1710.67	457675.76	2162296.90	-1704621.13
155+50	3139.20	619.84	9111.68	560.76	466787.44	2162857.65	-1696070.21
156+00	5806.81	53.07	15038.85	44.22	481826.29	2162901.88	-1681075.59
156+50	8958.61	0.00	20870.65	0.00	502696.94	2162901.88	-1660204.94
157+00	11532.58	0.00	24268.75	3.78	526965.69	2162905.66	-1635939.97
157+50	12294.92	4.54					

158+00	11982.64	0.08	24727.15	3.85	551692.84	2162909.51	-1611216.67
158+50	12604.82	0.00	25042.78	0.07	576735.62	2162909.57	-1586173.96
159+00	14057.17	0.00	27155.73	0.00	603891.34	2162909.57	-1559018.23
159+50	15579.47	0.00	30185.46	0.00	634076.80	2162909.57	-1528832.77
160+00	16690.92	0.00	32867.98	0.00	666944.79	2162909.57	-1495964.79
160+50	17851.61	0.00	35182.20	0.00	702126.99	2162909.57	-1460782.59
161+00	18754.93	0.00	37284.43	0.00	739411.42	2162909.57	-1423498.16
161+50	19309.37	0.00	38769.19	0.00	778180.61	2162909.57	-1384728.97
162+00	20185.55	0.00	40226.30	0.00	818406.91	2162909.57	-1344502.66
162+50	20519.83	0.00	41459.18	0.00	859866.09	2162909.57	-1303043.48
163+00	20318.49	0.00	41594.59	0.00	901460.68	2162909.57	-1261448.89
163+50	19837.87	0.00	40899.99	0.00	942360.67	2162909.57	-1220548.90
164+00	18958.70	0.00	39515.02	0.00	981875.69	2162909.57	-1181033.88
164+50	17446.55	0.00	37079.41	0.00	1018955.11	2162909.57	-1143954.47
165+00	15510.73	0.00	33567.60	0.00	1052522.71	2162909.57	-1110386.87
165+50	13555.96	0.00	29604.96	0.00	1082127.67	2162909.57	-1080781.91
166+00	11657.58	0.00	25680.45	0.00	1107808.12	2162909.57	-1055101.45
166+50	10823.99	0.00	22897.90	0.00	1130706.02	2162909.57	-1032203.56
167+00	11318.86	0.00	22552.91	0.00	1153258.93	2162909.57	-1009650.65
167+50	12179.47	0.00	23933.48	0.00	1177192.41	2162909.57	-985717.16
168+00	13040.56	0.00	25687.06	0.00	1202879.47	2162909.57	-960030.10
168+50	12881.87	0.00	26402.47	0.00	1229281.94	2162909.57	-933627.63
169+00	11248.32	0.00	24577.04	0.00	1253858.99	2162909.57	-909050.59
169+50	9414.66	0.00	21045.63	0.00	1274904.61	2162909.57	-888004.96
170+00	8184.75	0.09	17925.32	0.07	1292829.93	2162909.65	-870079.71
170+50	7254.05	11.35	15724.70	9.53	1308554.63	2162919.18	-854364.54
171+00	6548.00	38.03	14057.65	41.15	1322612.28	2162960.32	-840348.04
171+50	6001.94	75.33	12782.36	94.47	1335394.64	2163054.79	-827660.16
172+00	5764.46	116.50	11984.30	159.87	1347378.94	2163214.66	-815835.72
172+50	5284.33	132.25	11253.39	207.30	1358632.33	2163421.95	-804789.62
172+88.51	4534.79	129.82	7702.49	168.20	1366334.82	2163590.16	-797255.33
173+00	4321.09	159.31	2071.39	55.42	1368406.21	2163645.58	-795239.36
173+50	3246.03	336.06	7671.23	415.06	1376077.45	2164060.64	-787983.19
174+00	2092.88	638.13	5383.49	822.42	1381460.93	2164883.06	-783422.13
174+50	1168.08	1454.71	3272.91	1780.51	1384733.84	2166663.57	-781929.73
175+00	342.56	1769.78	1505.58	2757.13	1386239.42	2169420.70	-783181.28
175+50	343.34	468.54	682.54	1918.09	1386921.96	2171338.80	-784416.84
176+00	1714.05	0.00	2061.20	396.83	1388983.16	2171735.63	-782752.47
176+50	3065.70	0.00	4792.07	0.00	1393775.23	2171735.63	-777960.40
176+88.51	3901.99	0.00	5361.01	0.00	1399136.24	2171735.63	-772599.39
177+00	4181.12	0.00	1854.31	0.00	1400990.55	2171735.63	-770745.08
177+50	5842.52	0.00	10058.85	0.00	1411049.40	2171735.63	-760686.23
178+00	8352.80	0.00	14353.55	0.00	1425402.95	2171735.63	-746332.68
178+50	10212.15	0.00	18873.58	0.00	1444276.53	2171735.63	-727459.10
179+00	11510.52	0.00	22185.17	0.00	1466461.70	2171735.63	-705273.93
179+50	12984.50	0.00	25086.12	0.00	1491547.83	2171735.63	-680187.80
179+60.73	13136.63	0.00	5749.79	0.00	1497297.61	2171735.63	-674438.02
			20818.77	0.00	1518116.39	2171735.63	-653619.24

180+00	13119.45	0.00	25715.50	0.00	1543831.89	2171735.63	-627903.74
180+50	12373.92	0.00	24196.04	0.00	1568027.92	2171735.63	-603707.71
181+00	11568.54	0.00	22983.95	0.00	1591011.87	2171735.63	-580723.76
181+50	11112.61	0.00	22433.58	0.00	1613445.45	2171735.63	-558290.18
182+00	10979.07	0.00	22035.32	0.00	1635480.77	2171735.63	-536254.86
182+50	10694.12	0.00	21177.27	0.00	1656658.04	2171735.63	-515077.59
183+00	10126.22	0.00	18973.53	0.00	1675631.57	2171735.63	-496104.06
183+50	8516.00	0.00	3621.68	0.00	1679253.25	2171735.63	-492482.38
183+60.73	8055.03	0.00	11243.96	0.00	1690497.21	2171735.63	-481238.42
184+00	6001.02	0.00	9505.05	0.00	1700002.26	2171735.63	-471733.37
184+50	3331.21	0.00	4740.18	0.00	1704742.44	2171735.63	-466993.19
185+00	1322.78	0.00	1472.34	344.36	1706214.78	2172079.99	-465865.21
185+50	122.78	413.23	129.92	1718.34	1706344.70	2173798.33	-467453.63
186+00	4.78	1648.78	4.87	3284.04	1706349.57	2177082.37	-470732.81
186+50	0.00	2292.06	0.00	3562.90	1706349.57	2180645.28	-474295.71
187+00	0.00	1983.42	0.00	3031.01	1706349.57	2183676.29	-477326.72
187+50	0.00	1653.79	0.00	2847.94	1706349.57	2186524.22	-480174.66
188+00	0.00	1763.73	6.08	2101.90	1706355.64	2188626.12	-482270.48
188+50	5.97	758.55	213.93	834.12	1706569.58	2189460.24	-482890.66
189+00	204.07	242.39	523.68	280.74	1707093.26	2189740.98	-482647.72
189+50	310.08	94.50	648.39	108.88	1707741.64	2189849.86	-482108.22
190+00	326.51	36.16	468.61	203.57	1708210.26	2190053.43	-481843.18
190+50	133.58	208.12	144.26	587.76	1708354.52	2190641.19	-482286.67
191+00	8.06	497.19	92.24	486.61	1708446.76	2191127.80	-482681.04
191+50	82.51	86.75	1118.20	72.29	1709564.96	2191200.09	-481635.14
192+00	1015.36	0.00	3539.60	0.00	1713104.56	2191200.09	-478095.53
192+50	2459.89	0.00	6457.33	0.00	1719561.89	2191200.09	-471638.20
193+00	3880.04	0.00	9448.26	0.00	1729010.15	2191200.09	-462189.94
193+50	5396.43	0.00	11839.62	0.00	1740849.77	2191200.09	-450350.33
194+00	6227.92	0.00	13161.71	0.00	1754011.47	2191200.09	-437188.62
194+50	6694.48	0.00	13715.53	0.00	1767727.00	2191200.09	-423473.09
195+00	6771.68	0.00	13573.54	0.00	1781300.54	2191200.09	-409899.55
195+50	6555.07	0.00	12746.57	0.00	1794047.11	2191200.09	-397152.98
196+00	5959.75	0.00	11475.29	0.00	1805522.40	2191200.09	-385677.69
196+50	5306.91	0.00	10369.27	0.00	1815891.67	2191200.09	-375308.42
197+00	4873.83	0.00	9583.09	0.00	1825474.76	2191200.09	-365725.33
197+50	4535.03	0.00	8813.76	0.00	1834288.52	2191200.09	-356911.57
198+00	4118.48	0.00	8690.94	0.00	1842979.46	2191200.09	-348220.64
198+50	4414.44	0.00	9005.04	0.00	1851984.49	2191200.09	-339215.60
199+00	4426.87	0.00	8942.77	0.00	1860927.27	2191200.09	-330272.82
199+50	4353.30	0.00	8842.46	0.00	1869769.73	2191200.09	-321430.36
200+00	4328.38	0.00	8590.87	0.00	1878360.60	2191200.09	-312839.49
200+50	4106.29	0.00	9529.05	0.00	1887889.64	2191200.09	-303310.45
201+00	5249.50	0.00	11899.51	0.00	1899789.15	2191200.09	-291410.94
201+50	6433.65	0.00	13475.57	0.00	1913264.73	2191200.09	-277935.37
202+00	6796.91	0.00	13567.98	0.00	1926832.71	2191200.09	-264367.38
202+50	6524.38	0.00	13125.09	0.00	1939957.79	2191200.09	-251242.30
203+00	6362.07	0.00					

203+50	6030.11	0.00	12621.66	0.00	1952579.45	2191200.09	-238620.64
204+00	5795.04	0.00	12044.13	0.00	1964623.57	2191200.09	-226576.52
204+50	5539.61	0.00	11544.55	0.00	1976168.12	2191200.09	-215031.97
205+00	6084.68	0.00	11839.56	0.00	1988007.68	2191200.09	-203192.42
205+50	6927.58	0.00	13253.23	0.00	2001260.91	2191200.09	-189939.18
206+00	7438.68	0.00	14632.31	0.00	2015893.22	2191200.09	-175306.87
206+50	7086.36	0.00	14794.02	0.00	2030687.24	2191200.09	-160512.85
207+00	6346.67	0.00	13681.79	0.00	2044369.03	2191200.09	-146831.06
207+50	5526.66	0.00	12093.20	0.00	2056462.24	2191200.09	-134737.86
208+00	4779.73	0.00	10497.25	0.00	2066959.49	2191200.09	-124240.61
208+50	4373.05	0.00	9322.28	0.00	2076281.77	2191200.09	-114918.32
209+00	4374.71	0.00	8909.75	0.00	2085191.52	2191200.09	-106008.57
209+50	4205.17	0.00	8738.76	0.00	2093930.28	2191200.09	-97269.81
210+00	4114.62	0.00	8473.86	0.00	2102404.14	2191200.09	-88795.96
210+50	4342.54	0.00	8613.77	0.00	2111017.90	2191200.09	-80182.19
211+00	4868.64	0.00	9381.75	0.00	2120399.66	2191200.09	-70800.43
211+50	5103.61	0.00	10156.92	0.00	2130556.58	2191200.09	-60643.51
212+00	5737.50	0.00	11041.88	0.00	2141598.46	2191200.09	-49601.63
212+50	6797.72	0.00	12767.36	0.00	2154365.82	2191200.09	-36834.28
213+00	7890.53	0.00	14960.25	0.00	2169326.07	2191200.09	-21874.02
213+50	9257.11	0.00	17465.19	0.00	2186791.26	2191200.09	-4408.83
214+00	11057.36	0.00	20690.66	0.00	2207481.92	2191200.09	16281.83
214+50	12244.58	0.00	23733.45	0.00	2231215.37	2191200.09	40015.28
215+00	12182.71	0.00	24879.65	0.00	2256095.02	2191200.09	64894.93
215+50	10670.54	0.00	23276.46	0.00	2279371.48	2191200.09	88171.39
216+00	8525.73	0.00	19551.75	0.00	2298923.23	2191200.09	107723.14
216+50	6158.78	0.00	14956.44	0.00	2313879.67	2191200.09	122679.58
217+00	3940.97	0.00	10286.79	0.00	2324166.45	2191200.09	132966.36
217+50	2105.78	0.00	6158.73	0.00	2330325.19	2191200.09	139125.09
218+00	923.50	278.81	3085.38	232.34	2333410.57	2191432.43	141978.14
218+50	314.59	1250.39	1261.02	1274.33	2334671.59	2192706.76	141964.83
219+00	18.80	2576.69	339.57	3189.23	2335011.16	2195895.99	139115.16
219+50	0.00	4303.42	19.15	5733.43	2335030.31	2201629.42	133400.89
220+00	0.00	6455.91	0.00	8966.11	2335030.31	2210595.53	124434.78
220+50	0.00	8719.99	0.00	12646.59	2335030.31	2223242.12	111788.19
221+00	0.00	11567.62	0.00	16906.34	2335030.31	2240148.46	94881.85
221+50	0.00	14598.12	0.00	21804.78	2335030.31	2261953.24	73077.07
221+51.05	0.00	14653.20	0.00	511.86	2335030.31	2262465.11	72565.20
222+00	0.00	16678.14	0.00	25515.91	2335030.31	2287981.01	47049.30
222+50	0.00	17664.83	0.00	28486.40	2335030.31	2316467.42	18562.89
223+00	0.00	18545.25	0.00	29966.93	2335030.31	2346434.35	-11404.04
223+50	0.00	20694.98	0.00	32381.00	2335030.31	2378815.35	-43785.04
224+00	0.00	22770.57	0.00	35737.59	2335030.31	2414552.94	-79522.63
224+50	0.00	24864.88	0.00	39120.73	2335030.31	2453673.68	-118643.36
225+00	0.00	26423.39	0.00	42244.88	2335030.31	2495918.55	-160888.24
225+50	0.00	27082.47	0.00	44287.52	2335030.31	2540206.08	-205175.77
225+51.05	0.00	27092.03	0.00	944.10	2335030.31	2541150.18	-206119.87
			0.00	44428.26	2335030.31	2585578.44	-250548.13

226+00	0.00	27449.18	0.00	46206.41	2335030.31	2631784.85	-296754.54
226+50	0.00	27843.83	0.00	47356.46	2335030.31	2679141.31	-344111.00
227+00	0.00	28684.03	0.00	48946.28	2335030.31	2728087.59	-393057.28
227+50	0.00	29653.44	0.00	51097.64	2335030.31	2779185.23	-444154.92
228+00	0.00	31197.72	0.00	52143.84	2335030.31	2831329.07	-496298.76
228+50	0.00	30939.25	0.00	50664.84	2335030.31	2881993.91	-546963.60
229+00	0.00	29510.04	0.00	48737.46	2335030.31	2930731.38	-595701.07
229+50	0.00	28766.89	0.00	48715.61	2335030.31	2979446.99	-644416.68
230+00	0.00	29590.20	0.00	50762.30	2335030.31	3030209.29	-695178.98
230+50	0.00	31195.90	0.00	33121.22	2335030.31	3063330.51	-728300.20
230+81.15	0.00	32351.77	0.00	20353.55	2335030.31	3083684.05	-748653.74
231+00	0.00	32831.72	0.00	53977.90	2335030.31	3137661.96	-802631.65
231+50	0.00	32450.18	0.00	52384.61	2335030.31	3190046.57	-855016.25
232+00	0.00	30864.39	0.00	49988.85	2335030.31	3240035.41	-905005.10
232+50	0.00	29579.54	0.00	48578.00	2335030.31	3288613.41	-953583.10
233+00	0.00	29216.39	0.00	50553.31	2335030.31	3339166.72	-1004136.41
233+50	0.00	31901.78	0.00	55635.69	2335030.31	3394802.41	-1059772.10
234+00	0.00	35235.91	0.00	62190.89	2335030.31	3456993.30	-1121962.99
234+50	0.00	39635.23	0.00	42876.83	2335030.31	3499870.13	-1164839.82
234+81.15	0.00	43042.28	0.00	27437.50	2335030.31	3527307.63	-1192277.32
235+00	0.00	44272.67	0.00	72764.91	2335030.31	3600072.54	-1265042.23
235+50	0.00	43045.23	0.00	70918.60	2335030.31	3670991.14	-1335960.83
236+00	0.00	42057.10	0.00	70179.80	2335030.31	3741170.94	-1406140.63
236+50	0.00	42158.66	0.00	70789.61	2335030.31	3811960.55	-1476930.24
237+00	0.00	42788.87	0.00	74165.86	2335030.31	3886126.41	-1551096.10
237+50	0.00	46210.16	0.00	79579.57	2335030.31	3965705.98	-1630675.67
238+00	0.00	49285.33	0.00	85059.69	2335030.31	4050765.68	-1715735.37
238+50	0.00	52786.30	0.00	90605.19	2335030.31	4141370.87	-1806340.56
239+00	0.00	55939.93	0.00	94554.75	2335030.31	4235925.62	-1900895.30
239+50	0.00	57525.77	0.00	97437.39	2335030.31	4333363.01	-1998332.70
240+00	0.00	59399.10	0.00	99517.72	2335030.31	4432880.73	-2097850.42
240+50	0.00	60022.17	0.00	100123.07	2335030.31	4533003.80	-2197973.49
241+00	0.00	60125.52	0.00	99623.99	2335030.31	4632627.79	-2297597.48
241+50	0.00	59423.27	0.00	97449.26	2335030.31	4730077.05	-2395046.74
242+00	0.00	57515.84	0.00	94290.87	2335030.31	4824367.92	-2489337.61
242+50	0.00	55633.21	0.00	91537.37	2335030.31	4915905.29	-2580874.98
243+00	0.00	54211.64	0.00	89320.27	2335030.31	5005225.56	-2670195.25
243+50	0.00	52972.68	0.00	85277.32	2335030.31	5090502.88	-2755472.57
244+00	0.00	49360.10	0.00	6296.09	2335030.31	5096798.97	-2761768.66
244+03.84	0.00	48902.25	0.00	71151.56	2335030.31	5167950.53	-2832920.22
244+50	0.00	43633.73	0.00	67317.24	2335030.31	5235267.77	-2900237.46
245+00	0.00	37198.54	0.00	56120.18	2335030.31	5291387.95	-2956357.64
245+50	0.00	30147.78	0.00	44793.76	2335030.31	5336181.71	-3001151.40
246+00	0.00	23546.06	0.00	34270.09	2335030.31	5370451.80	-3035421.49
246+50	0.00	17464.42	0.00	24800.08	2335030.31	5395251.88	-3060221.57
247+00	0.00	12157.58	0.00	16482.62	2335030.31	5411734.49	-3076704.18
247+50	0.00	7487.74	0.00	9457.10	2335030.31	5421191.60	-3086161.29
248+00	0.00	3748.37					

248+03.84	0.00	3509.82	0.00	470.69	2335030.31	5421662.28	-3086631.97
248+50	0.00	983.30	0.00	3506.30	2335030.31	5425168.59	-3090138.28
249+00	661.22	0.00	668.39	826.28	2335698.70	5425994.87	-3090296.17
249+50	1963.62	0.00	2665.84	0.00	2338364.55	5425994.87	-3087630.32
250+00	3447.28	0.00	5577.41	0.00	2343941.95	5425994.87	-3082052.92
250+50	4744.08	0.00	8488.63	0.00	2352430.58	5425994.87	-3073564.29
251+00	5001.82	0.00	10134.67	0.00	2362565.25	5425994.87	-3063429.62
251+50	4545.65	0.00	9976.93	0.00	2372542.18	5425994.87	-3053452.69
252+00	3437.13	0.00	8445.88	0.00	2380988.06	5425994.87	-3045006.81
252+19.42	3097.25	68.33	2714.38	21.53	2383702.45	5426016.40	-3042313.96
252+50	2557.66	397.57	3338.64	249.44	2387041.08	5426265.84	-3039224.76
253+00	1554.96	1286.90	3982.11	1467.36	2391023.19	5427733.20	-3036710.01
253+50	761.76	2571.90	2254.55	3344.64	2393277.74	5431077.84	-3037800.10
254+00	1262.35	3074.26	1972.16	4872.97	2395249.91	5435950.81	-3040700.91
254+50	2360.47	3181.82	3549.19	5376.39	2398799.10	5441327.21	-3042528.11
255+00	2754.66	2854.48	5076.09	5156.97	2403875.18	5446484.18	-3042609.00
255+50	2269.19	2128.87	5045.04	4224.80	2408920.22	5450708.98	-3041788.76
256+00	1213.07	1357.57	3524.53	2928.17	2412444.75	5453637.15	-3041192.40
256+19.42	829.23	1347.18	806.67	876.71	2413251.41	5454513.85	-3041262.44

Segment G

Segment: G

Station	END AREA VOLUME LISTING WITH CURVE CORRECTION		Fill		Cut		Fill		Mass Ordinate
	Cut Area (sqft)	Fill Area (sqft)	Cut 1.1000 Volume (yds)	Fill 0.9000 Volume (yds)	Cut 1.1000 Volume (yds)	Fill 0.9000 Volume (yds)	Cut 1.1000 Volume (yds)	Fill 0.9000 Volume (yds)	
0+00	724.77	1502.53							
0+50	422.85	2444.55	1168.86	3289.23	1168.86	3289.23			-2120.37
1+00	301.30	3426.53	737.56	4892.57	1906.42	8181.80			-6275.38
1+50	323.84	3653.32	636.72	5899.88	2543.14	14081.68			-11538.54
2+00	391.36	2889.56	728.44	5452.40	3271.58	19534.09			-16262.50
2+50	487.36	1965.18	894.99	4045.62	4166.57	23579.70			-19413.13
3+00	634.59	976.81	1142.73	2451.66	5309.30	26031.36			-20722.06
3+50	857.70	522.32	1519.93	1249.27	6829.23	27280.63			-20451.41
4+00	1381.35	102.87	2280.52	520.99	9109.74	27801.63			-18691.88
4+50	2344.19	0.00	3794.54	85.73	12904.28	27887.36			-14983.07
5+00	3252.16	0.00	5699.98	0.00	18604.27	27887.36			-9283.09
5+50	4867.90	0.00	8270.43	0.00	26874.70	27887.36			-1012.66
6+00	6998.50	0.00	12086.15	0.00	38960.84	27887.36			11073.48
6+50	10121.23	0.00	17436.75	0.00	56397.59	27887.36			28510.24
7+00	13154.86	0.00	23707.12	0.00	80104.72	27887.36			52217.36
7+50	15606.81	0.00	29294.30	0.00	109399.01	27887.36			81511.65
8+00	17149.86	0.00	33363.28	0.00	142762.29	27887.36			114874.94
8+50	17588.59	0.00	35381.76	0.00	178144.05	27887.36			150256.69
9+00	16842.59	0.00	35068.79	0.00	213212.84	27887.36			185325.48
9+50	15516.90	0.00	32958.73	0.00	246171.57	27887.36			218284.22
10+00	13633.67	0.00	29690.39	0.00	275861.96	27887.36			247974.61
10+50	11528.62	0.00	25628.26	0.00	301490.22	27887.36			273602.87
11+00	9437.93	0.00	21354.82	0.00	322845.04	27887.36			294957.68
11+34.96	7996.50	0.00	12416.80	0.00	335261.83	27887.36			307374.48
11+50	7378.50	0.00	4709.37	0.00	339971.20	27887.36			312083.85
12+00	4949.40	0.00	12552.39	0.00	352523.59	27887.36			324636.23
12+50	2270.30	0.00	7348.81	0.00	359872.41	27887.36			331985.05
13+00	171.34	558.41	2483.06	465.80	362355.47	28353.16			334002.31
13+50	0.00	3690.84	174.27	3549.59	362529.73	31902.75			330626.99
14+00	0.00	7160.24	0.00	9066.80	362529.73	40969.55			321560.19
14+50	0.00	9730.00	0.00	14122.80	362529.73	55092.35			307437.38
15+00	0.00	10723.24	0.00	17118.17	362529.73	72210.52			290319.21
15+34.96	0.00	10733.51	0.00	12569.18	362529.73	84779.70			277750.03
15+50	0.00	10657.70	0.00	5392.38	362529.73	90172.08			272357.66
16+00	0.00	10392.38	0.00	17652.71	362529.73	107824.79			254704.95
16+50	0.00	10533.48	0.00	17561.71	362529.73	125386.50			237143.23
17+00	0.00	11097.80	0.00	18161.88	362529.73	143548.38			218981.36
17+50	0.00	11186.94	0.00	18712.87	362529.73	162261.25			200268.49
18+00	0.00	11074.14	0.00	18695.46	362529.73	180956.71			181573.02
18+50	0.00	10920.04	0.00	18476.77	362529.73	199433.48			163096.25
19+00	0.00	11131.50	0.00	18536.45	362529.73	217969.93			144559.81
19+50	0.00	11458.43	0.00	19003.15	362529.73	236973.08			125556.65
20+00	0.00	11770.89	0.00	19549.53	362529.73	256522.61			106007.12

20+50	0.00	12160.61	0.00	20143.78	362529.73	276666.39	85863.35
21+00	0.00	12564.37	0.00	20812.83	362529.73	297479.22	65050.51
21+50	0.00	12875.87	0.00	21414.40	362529.73	318893.62	43636.11
22+00	0.00	13281.73	0.00	22018.67	362529.73	340912.30	21617.44
22+50	0.00	13855.38	0.00	22846.26	362529.73	363758.56	-1228.82
23+00	0.00	14440.03	0.00	23822.18	362529.73	387580.74	-25051.00
23+50	0.00	14829.17	0.00	24638.11	362529.73	412218.85	-49689.12
24+00	0.00	15053.10	0.00	25146.09	362529.73	437364.94	-74835.20
24+50	0.00	15113.53	0.00	25373.56	362529.73	462738.49	-100208.76
25+00	0.00	15200.93	0.00	25485.46	362529.73	488223.95	-125694.22
25+50	0.00	15497.66	0.00	25794.52	362529.73	514018.48	-151488.74
26+00	0.00	15779.65	0.00	26268.53	362529.73	540287.01	-177757.27
26+50	0.00	15626.23	0.00	26381.05	362529.73	566668.05	-204138.32
27+00	0.00	14533.36	0.00	25346.50	362529.73	592014.56	-229484.82
27+50	0.00	12661.85	0.00	22839.37	362529.73	614853.93	-252324.20
28+00	0.00	11712.88	0.00	20436.62	362529.73	635290.55	-272760.81
28+17.50	0.00	12136.43	0.00	6991.86	362529.73	642282.41	-279752.67
28+50	0.00	13142.97	0.00	13619.05	362529.73	655901.46	-293371.73
29+00	0.00	14341.60	0.00	22773.09	362529.73	678674.56	-316144.82
29+50	0.00	14962.22	0.00	24279.58	362529.73	702954.14	-340424.40
30+00	0.00	14981.01	0.00	24817.57	362529.73	727771.71	-365241.97
30+50	0.00	14428.89	0.00	24393.69	362529.73	752165.40	-389635.66
31+00	0.00	13929.01	0.00	23547.82	362529.73	775713.22	-413183.49
31+50	0.00	13809.69	0.00	23064.40	362529.73	798777.62	-436247.88
32+00	0.00	13846.32	0.00	23024.95	362529.73	821802.57	-459272.83
32+17.50	0.00	13882.39	0.00	8084.23	362529.73	829886.80	-467357.07
32+50	0.00	13855.46	0.00	15026.49	362529.73	844913.29	-482383.55
33+00	0.00	13365.56	0.00	22684.19	362529.73	867597.47	-505067.74
33+50	0.00	12464.80	0.00	21525.30	362529.73	889122.77	-526593.04
34+00	0.00	11263.65	0.00	19773.70	362529.73	908896.48	-546366.75
34+50	0.00	10075.97	0.00	17783.02	362529.73	926679.50	-564149.76
35+00	0.00	9026.88	0.00	15919.05	362529.73	942598.54	-580068.81
35+50	0.00	8055.07	0.00	14234.96	362529.73	956833.50	-594303.77
36+00	0.00	7099.42	0.00	12628.74	362529.73	969462.24	-606932.51
36+50	12.69	6197.78	12.92	11081.01	362542.65	980543.25	-618000.59
37+00	56.29	5362.19	70.25	9633.31	362612.90	990176.56	-627563.66
37+50	164.29	4572.84	224.66	8279.19	362837.56	998455.75	-635618.19
38+00	379.98	3843.46	554.35	7013.58	363391.91	1005469.33	-642077.42
38+50	660.13	3189.75	1059.38	5861.01	364451.29	1011330.34	-646879.05
39+00	787.69	2745.38	1474.64	4945.94	365925.92	1016276.28	-650350.36
39+50	763.44	2605.05	1579.85	4458.69	367505.77	1020734.97	-653229.20
40+00	454.64	2725.63	1240.63	4442.24	368746.40	1025177.21	-656430.81
40+50	128.99	3354.25	594.44	5066.57	369340.84	1030243.78	-660902.94
41+00	0.00	4672.12	131.38	6688.64	369472.23	1036932.42	-667460.20
41+50	0.00	6803.89	0.00	9563.34	369472.23	1046495.77	-677023.54
42+00	0.00	9484.78	0.00	13573.89	369472.23	1060069.66	-690597.43
42+50	0.00	13153.24	0.00	18865.02	369472.23	1078934.68	-709462.45
			0.00	25643.04	369472.23	1104577.72	-735105.49

43+00	0.00	17618.41	0.00	32739.75	369472.23	1137317.47	-767845.24
43+50	0.00	21669.30	0.00	39386.42	369472.23	1176703.89	-807231.67
44+00	0.00	25594.41	0.00	45508.64	369472.23	1222212.53	-852740.30
44+50	0.00	29015.96	0.00	50252.68	369472.23	1272465.21	-902992.98
45+00	0.00	31287.26	0.00	53049.46	369472.23	1325514.67	-956042.44
45+50	0.00	32372.09	0.00	53274.13	369472.23	1378788.80	-1009316.57
46+00	0.00	31556.87	0.00	51447.07	369472.23	1430235.87	-1060763.65
46+50	0.00	30179.62	0.00	49190.45	369472.23	1479426.32	-1109954.09
47+00	0.00	28848.92	0.00	47131.06	369472.23	1526557.38	-1157085.16
47+50	0.00	27708.36	0.00	45322.23	369472.23	1571879.61	-1202407.39
48+00	0.00	26678.31	0.00	43907.81	369472.23	1615787.42	-1246315.20
48+50	0.00	26011.06	0.00	42382.04	369472.23	1658169.47	-1288697.24
49+00	0.00	24847.39	0.00	41775.33	369472.23	1699944.80	-1330472.57
49+50	0.00	25283.01	0.00	39672.41	369472.23	1739617.21	-1370144.99
50+00	0.00	22323.89	0.00	34715.58	369472.23	1774332.79	-1404860.56
50+50	0.00	19334.80	0.00	30913.05	369472.23	1805245.84	-1435773.61
51+00	0.00	17760.86	0.00	27789.33	369472.23	1833035.17	-1463562.94
51+50	0.00	15586.34	0.00	23448.52	369472.23	1856483.69	-1487011.46
52+00	0.00	12551.88	0.00	18315.28	369472.23	1874798.96	-1505326.74
52+50	0.00	9426.45	0.00	14119.40	369472.23	1888918.37	-1519446.14
53+00	0.00	7516.83	0.00	11422.70	369472.23	1900341.07	-1530868.85
53+50	0.00	6190.41	0.00	9387.89	369472.23	1909728.96	-1540256.73
54+00	0.00	5075.05	1.45	7382.23	369473.67	1917111.19	-1547637.52
54+50	1.42	3783.63	247.19	4651.83	369720.86	1921763.02	-1552042.15
55+00	241.27	1798.56	1641.96	1890.66	371362.82	1923653.68	-1552290.86
55+50	1370.83	470.23	4829.46	398.61	376192.28	1924052.29	-1547860.01
56+00	3370.82	8.10	9536.58	6.75	385728.86	1924059.04	-1538330.18
56+50	5992.37	0.00	15027.67	0.00	400756.53	1924059.04	-1523302.51
57+00	8762.07	0.00	20283.73	0.00	421040.25	1924059.04	-1503018.78
57+50	11152.86	0.00	24805.81	0.00	445846.07	1924059.04	-1478212.97
58+00	13201.93	0.00	28766.68	0.00	474612.74	1924059.04	-1449446.30
58+50	15041.71	0.00	32048.55	0.00	506661.29	1924059.04	-1417397.75
59+00	16424.14	0.00	34432.83	0.00	541094.13	1924059.04	-1382964.91
59+50	17382.65	0.00	35513.39	0.00	576607.51	1924059.04	-1347451.53
60+00	17485.04	0.00	35632.35	0.00	612239.86	1924059.04	-1311819.18
60+50	17499.45	0.00	35855.95	0.00	648095.82	1924059.04	-1275963.22
61+00	17704.58	0.00	36319.24	0.00	684415.05	1924059.04	-1239643.99
61+50	17954.31	0.00	35624.72	0.00	720039.78	1924059.04	-1204019.26
62+00	17022.69	0.00	32179.14	0.00	752218.92	1924059.04	-1171840.12
62+50	14571.38	0.00	25858.28	0.00	778077.20	1924059.04	-1145981.84
63+00	10816.76	0.00	17530.94	0.00	795608.15	1924059.04	-1128450.89
63+50	6395.44	0.00	8970.35	10.36	804578.50	1924069.39	-1119490.90
64+00	2411.81	12.43	2931.84	953.52	807510.34	1925022.92	-1117512.58
64+50	466.72	1131.80	602.03	3657.17	808112.37	1928680.09	-1120567.72
65+00	124.36	3256.81	139.27	6610.59	808251.64	1935290.68	-1127039.04
65+50	12.38	4675.90	101.29	7925.08	808352.93	1943215.76	-1134862.83
66+00	87.07	4834.20	365.57	7214.81	808718.50	1950430.56	-1141712.07
66+50	271.85	3823.57					

67+00	737.78	2457.23	1028.32	5234.00	809746.82	1955664.56	-1145917.74
67+50	1717.77	1279.59	2501.02	3114.01	812247.84	1958778.58	-1146530.73
68+00	3251.93	317.91	5061.74	1331.25	817309.58	1960109.83	-1142800.25
68+50	5419.59	0.00	8832.11	264.93	826141.69	1960374.76	-1134233.07
69+00	7593.54	0.00	13254.12	0.00	839395.81	1960374.76	-1120978.95
69+50	9267.74	0.00	17173.53	0.00	856569.34	1960374.76	-1103805.42
70+00	11001.47	0.00	20644.57	0.00	877213.91	1960374.76	-1083160.85
70+50	12776.52	0.00	24218.32	0.00	901432.23	1960374.76	-1058942.53
71+00	14549.03	0.00	27831.58	0.00	929263.81	1960374.76	-1031110.95
71+50	16158.44	0.00	31276.13	0.00	960539.93	1960374.76	-999834.82
72+00	17454.66	0.00	34235.57	0.00	994775.51	1960374.76	-965599.25
72+50	18676.17	0.00	36799.92	0.00	1031575.43	1960374.76	-928799.33
73+00	19531.33	0.00	38915.04	0.00	1070490.47	1960374.76	-889884.29
73+50	20061.33	0.00	40325.86	0.00	1110816.32	1960374.76	-849558.43
74+00	20137.46	0.00	40943.21	0.00	1151759.53	1960374.76	-808615.22
74+50	19861.18	0.00	40739.35	0.00	1192498.88	1960374.76	-767875.87
75+00	19824.17	0.00	40420.26	0.00	1232919.14	1960374.76	-727455.61
75+50	20625.04	0.00	41198.27	0.00	1274117.41	1960374.76	-686257.35
76+00	20917.87	0.00	42312.23	0.00	1316429.64	1960374.76	-643945.12
76+50	20998.29	0.00	42692.39	0.00	1359122.03	1960374.76	-601252.73
77+00	20162.70	0.00	41923.23	0.00	1401045.26	1960374.76	-559329.50
77+50	18336.18	0.00	39211.82	0.00	1440257.09	1960374.76	-520117.67
78+00	15623.76	0.00	34588.83	0.00	1474845.91	1960374.76	-485528.84
78+50	12720.95	0.00	28869.61	0.00	1503715.52	1960374.76	-456659.23
79+00	10065.51	0.00	23208.43	0.00	1526923.95	1960374.76	-433450.80
79+50	8212.01	0.00	18615.99	0.00	1545539.94	1960374.76	-414834.81
80+00	7034.00	0.00	15528.34	0.00	1561068.29	1960374.76	-399306.47
80+50	6844.08	18.49	14135.08	15.40	1575203.37	1960390.16	-385186.79
81+00	8048.74	14.12	15168.62	27.17	1590371.99	1960417.33	-370045.35
81+50	10275.25	0.00	18663.33	11.77	1609035.31	1960429.10	-351393.78
82+00	13681.78	0.00	24400.68	0.00	1633435.99	1960429.10	-326993.11
82+50	17868.87	0.00	32134.92	0.00	1665570.91	1960429.10	-294858.18
83+00	21896.99	0.00	40502.27	0.00	1706073.18	1960429.10	-254355.91
83+50	25124.39	0.00	47892.15	0.00	1753965.33	1960429.10	-206463.76
84+00	27845.89	0.00	53951.22	0.00	1807916.55	1960429.10	-152512.54
84+50	29943.47	0.00	58859.54	0.00	1866776.09	1960429.10	-93653.01
85+00	31259.10	0.00	62335.95	0.00	1929112.04	1960429.10	-31317.06
85+20.25	31621.92	0.00	25936.99	0.00	1955049.03	1960429.10	-5380.07
85+50	31737.81	0.00	38534.39	0.00	1993583.42	1960429.10	33154.33
86+00	31076.66	0.00	64820.33	0.00	2058403.76	1960429.10	97974.66
86+50	29812.62	0.00	63562.65	0.00	2121966.41	1960429.10	161537.31
87+00	28849.00	0.00	61903.40	0.00	2183869.81	1960429.10	223440.71
87+50	27267.89	0.00	59778.73	0.00	2243648.54	1960429.10	283219.45
88+00	25271.93	0.00	56330.67	0.00	2299979.21	1960429.10	339550.12
88+50	23268.01	0.00	52246.67	0.00	2352225.88	1960429.10	391796.78
89+00	21466.53	0.00	48221.18	0.00	2400447.06	1960429.10	440017.96
89+20.25	20743.04	0.00	18417.24	0.00	2418864.30	1960429.10	458435.21
			25839.20	0.00	2444703.50	1960429.10	484274.41

89+50	19676.81	0.00					
90+00	17773.17	0.00	39975.65	0.00	2484679.15	1960429.10	524250.05
90+50	16025.88	0.00	35801.40	0.00	2520480.55	1960429.10	560051.46
90+69.55	15205.05	0.00	12861.01	0.00	2533341.57	1960429.10	572912.47
91+00	13909.00	0.00	17549.58	0.00	2550891.15	1960429.10	590462.05
91+50	11835.42	0.00	25726.27	0.00	2576617.42	1960429.10	616188.33
92+00	9753.23	0.00	21774.13	0.00	2598391.55	1960429.10	637962.45
92+50	7615.73	0.00	17629.89	0.00	2616021.44	1960429.10	655592.35
93+00	5423.47	0.00	13283.79	0.00	2629305.24	1960429.10	668876.14
93+50	3432.40	0.00	9039.54	0.00	2638344.78	1960429.10	677915.68
94+00	1666.21	0.00	5209.86	0.00	2643554.63	1960429.10	683125.54
94+50	539.69	293.52	2252.94	244.00	2645807.58	1960673.10	685134.48
94+69.55	238.86	596.88	310.26	289.78	2646117.84	1960962.88	685154.96
95+00	7.39	1271.04	152.76	948.05	2646270.60	1961910.93	684359.67
95+50	0.00	2811.67	7.53	3402.26	2646278.13	1965313.19	680964.94
96+00	0.00	4189.56	0.00	5834.36	2646278.13	1971147.55	675130.58
96+50	0.00	5979.91	0.00	8474.56	2646278.13	1979622.11	666656.02
97+00	0.00	7997.30	0.00	11647.68	2646278.13	1991269.79	655008.34
97+50	0.00	10135.52	0.00	15110.68	2646278.13	2006380.48	639897.65
98+00	0.00	12679.03	0.00	19012.12	2646278.13	2025392.59	620885.53
98+50	0.00	15491.92	0.00	23475.78	2646278.13	2048868.38	597409.75
99+00	0.00	18152.49	0.00	28037.00	2646278.13	2076905.38	569372.75
99+50	0.00	21789.51	0.00	33285.00	2646278.13	2110190.38	536087.75
100+00	0.00	25567.42	0.00	39464.11	2646278.13	2149654.49	496623.64
100+50	0.00	28450.33	0.00	45014.79	2646278.13	2194669.28	451608.85
101+00	0.00	30160.20	0.00	48842.11	2646278.13	2243511.39	402766.74
101+50	0.00	30195.76	0.00	50296.63	2646278.13	2293808.01	352470.12
102+00	0.00	28733.53	0.00	49107.74	2646278.13	2342915.75	303362.38
102+50	0.00	27138.67	0.00	46560.17	2646278.13	2389475.92	256802.21
103+00	0.00	24333.17	0.00	42893.20	2646278.13	2432369.12	213909.01
103+50	0.00	21101.39	0.00	37862.13	2646278.13	2470231.26	176046.87
104+00	0.00	19179.66	0.00	33567.54	2646278.13	2503798.80	142479.33
104+50	0.00	17555.21	0.00	30612.40	2646278.13	2534411.20	111866.93
104+50.65	0.00	17537.14	0.00	380.50	2646278.13	2534791.69	111486.44
105+00	0.00	15926.49	0.00	27663.90	2646278.13	2562455.59	83822.54
105+50	0.00	14058.39	0.00	25368.47	2646278.13	2587824.06	58454.07
106+00	0.00	12965.88	0.00	23114.11	2646278.13	2610938.17	35339.96
106+50	90.72	12350.39	91.14	21949.42	2646369.27	2632887.58	13481.68
107+00	227.41	12049.28	312.49	21490.09	2646681.76	2654377.67	-7695.91
107+50	364.97	11660.13	576.34	21236.23	2647258.11	2675613.90	-28355.80
108+00	475.86	11102.56	810.96	20764.76	2648069.07	2696378.66	-48309.59
108+50	441.53	10052.06	878.78	19676.22	2648947.85	2716054.88	-67107.03
108+50.65	440.18	10036.51	10.95	245.53	2648958.80	2716300.41	-67341.61
109+00	364.60	8714.21	758.54	17370.28	2649717.34	2733670.69	-83953.35
109+50	349.17	7528.07	682.03	15141.54	2650399.37	2748812.23	-98412.86
110+00	301.93	7373.71	621.95	13706.81	2651021.32	2762519.04	-111497.72
110+50	279.66	7777.95	555.00	13826.05	2651576.32	2776345.08	-124768.77
111+00	303.05	7814.64	555.67	14209.98	2652131.99	2790555.06	-138423.07

111+50	381.27	7303.47	651.85	13759.39	2652783.84	2804314.45	-151530.61
112+00	495.88	6378.48	835.15	12412.55	2653618.98	2816727.00	-163108.02
112+50	487.36	4354.91	937.00	9676.25	2654555.98	2826403.25	-171847.27
113+00	358.66	2182.85	807.06	5805.94	2655363.04	2832209.19	-176846.15
113+50	562.11	1303.07	878.01	3046.60	2656241.05	2835255.78	-179014.73
114+00	1232.39	820.84	1711.09	1845.58	2657952.14	2837101.36	-179149.22
114+50	1577.17	638.36	2672.08	1266.52	2660624.22	2838367.88	-177743.66
114+60.79	1910.05	602.07	713.40	232.52	2661337.62	2838600.39	-177262.77
115+00	2960.81	757.42	4172.64	857.51	2665510.26	2839457.90	-173947.64
115+50	1951.53	893.70	5366.09	1349.33	2670876.35	2840807.24	-169930.88
116+00	3.94	1678.46	2095.94	2123.19	2672972.29	2842930.42	-169958.13
116+50	0.43	3368.74	4.60	4156.66	2672976.89	2847087.09	-174110.19
117+00	0.00	7688.75	0.45	9025.44	2672977.34	2856112.53	-183135.19
117+50	0.00	9282.02	0.00	13860.76	2672977.34	2869973.29	-196995.95
118+00	0.00	10502.40	0.00	16285.89	2672977.34	2886259.18	-213281.85
118+50	0.00	12072.93	0.00	18716.50	2672977.34	2904975.69	-231998.35
118+60.79	0.00	12463.01	0.00	4409.99	2672977.34	2909385.67	-236408.34
119+00	0.00	14356.19	0.00	17525.16	2672977.34	2926910.83	-253933.50
119+50	0.00	16692.64	0.00	25874.02	2672977.34	2952784.86	-279807.52
120+00	0.00	19195.02	0.00	29906.38	2672977.34	2982691.24	-309713.90
120+50	0.00	21676.97	0.00	34059.99	2672977.34	3016751.24	-343773.90
121+00	0.00	23715.11	0.00	37826.73	2672977.34	3054577.97	-381600.63
121+50	0.00	25822.12	0.00	41281.03	2672977.34	3095859.00	-422881.66
122+00	0.00	27099.66	0.00	44101.48	2672977.34	3139960.48	-466983.14
122+50	0.00	26753.34	0.00	44877.50	2672977.34	3184837.98	-511860.64
123+00	0.00	25423.68	0.00	43480.85	2672977.34	3228318.84	-555341.50
123+50	0.00	24949.40	0.00	41977.57	2672977.34	3270296.41	-597319.07
124+00	0.00	24933.60	0.00	41569.17	2672977.34	3311865.57	-638888.24
124+50	0.00	24806.78	0.00	41450.31	2672977.34	3353315.88	-680338.55
125+00	0.00	24219.41	0.00	40855.16	2672977.34	3394171.04	-721193.71
125+50	0.00	22487.95	0.00	38922.80	2672977.34	3433093.85	-760116.51
126+00	0.00	20325.41	0.00	35677.80	2672977.34	3468771.65	-795794.31
126+41.59	0.00	18259.31	0.00	26747.34	2672977.34	3495518.98	-822541.64
126+50	0.00	17854.19	0.00	5057.07	2672977.34	3500576.05	-827598.71
127+00	0.00	14977.46	0.00	27220.25	2672977.34	3527796.30	-854818.96
127+50	0.00	11659.74	0.00	21921.23	2672977.34	3549717.54	-876740.20
128+00	0.00	8443.46	0.00	16429.27	2672977.34	3566146.81	-893169.47
128+50	0.00	5482.57	0.00	11297.79	2672977.34	3577444.60	-904467.26
129+00	234.66	3179.30	243.04	6973.39	2673220.38	3584417.99	-911197.61
129+50	894.92	1718.58	1195.43	3911.54	2674415.81	3588329.52	-913913.72
130+00	1317.04	957.07	2348.17	2123.52	2676763.97	3590453.04	-913689.07
130+41.59	1782.46	707.79	2754.13	1095.22	2679518.10	3591548.26	-912030.15
130+50	2049.87	650.64	692.88	180.31	2680210.98	3591728.57	-911517.59
131+00	4953.49	276.56	7582.44	730.16	2687793.42	3592458.73	-904665.31
131+50	7751.39	0.00	13788.18	223.86	2701581.60	3592682.58	-891100.99
132+00	9786.28	0.00	18968.52	0.00	2720550.11	3592682.58	-872132.47
132+50	11536.42	0.00	23105.68	0.00	2743655.79	3592682.58	-849026.79
			27237.36	0.00	2770893.15	3592682.58	-821789.43

133+00	13463.39	0.00						
			32142.17	0.00	2803035.33	3592682.58	-789647.26	
133+50	15883.44	0.00						
			37062.98	0.00	2840098.30	3592682.58	-752584.28	
134+00	17788.55	0.00						
			9996.55	0.00	2850094.85	3592682.58	-742587.73	
134+12.59	18168.92	0.00						
			26053.40	0.00	2876148.25	3592682.58	-716534.33	
134+50	19055.38	0.00						
			36590.86	0.00	2912739.12	3592682.58	-679943.47	
135+00	19721.71	0.00						
			37598.76	0.00	2950337.88	3592682.58	-642344.71	
135+50	19641.80	0.00						
			37253.02	0.00	2987590.89	3592682.58	-605091.69	
136+00	18834.45	0.00						
			35933.11	0.00	3023524.01	3592682.58	-569158.58	
136+50	17820.24	0.00						
			33550.18	0.00	3057074.19	3592682.58	-535608.40	
137+00	16017.39	0.00						
			30129.79	0.00	3087203.98	3592682.58	-505478.60	
137+50	14053.80	0.00						
			26504.85	0.00	3113708.84	3592682.58	-478973.75	
138+00	12150.54	0.00						
			6102.24	0.00	3119811.08	3592682.58	-472871.51	
138+12.59	11669.70	0.00						
			16692.68	0.00	3136503.76	3592682.58	-456178.82	
138+50	10235.54	0.00						
			18896.34	20.27	3155400.10	3592702.85	-437302.75	
139+00	8317.23	24.32						
			15065.79	258.79	3170465.89	3592961.64	-422495.75	
139+50	6474.63	286.22						
			11578.82	863.27	3182044.71	3593824.91	-411780.20	
140+00	4893.66	749.70						
			8568.47	1745.40	3190613.18	3595570.30	-404957.12	
140+50	3519.02	1344.78						
			6066.80	2767.42	3196679.98	3598337.72	-401657.74	
141+00	2437.48	1976.12						
			4151.52	3783.52	3200831.50	3602121.24	-401289.73	
141+50	1638.56	2564.10						
			2755.97	4719.65	3203587.48	3606840.89	-403253.41	
142+00	1067.30	3099.48						
			1720.52	5534.08	3205307.99	3612374.96	-407066.97	
142+50	621.93	3541.41						
			920.26	6258.33	3206228.26	3618633.29	-412405.03	
143+00	281.60	3968.58						
			385.97	7101.85	3206614.23	3625735.14	-419120.91	
143+50	97.36	4553.64						
			116.02	8211.02	3206730.25	3633946.16	-427215.91	
144+00	16.55	5299.58						
			17.17	8934.98	3206747.42	3642881.14	-436133.72	
144+50	0.30	5422.40						
			0.31	8974.96	3206747.73	3651856.10	-445108.37	
145+00	0.00	5347.55						
			0.00	8705.67	3206747.73	3660561.77	-453814.05	
145+50	0.00	5099.26						
			0.00	8284.33	3206747.73	3668846.11	-462098.38	
146+00	0.00	4841.94						
			0.00	7784.05	3206747.73	3676630.16	-469882.43	
146+50	0.00	4498.92						
			0.00	7104.21	3206747.73	3683734.37	-476986.64	
147+00	0.00	4026.13						
			0.00	6212.28	3206747.73	3689946.65	-483198.92	
147+50	0.00	3428.60						
			18.42	5356.32	3206766.15	3695302.96	-488536.82	
148+00	18.09	2998.98						
			194.06	4871.78	3206960.21	3700174.74	-493214.53	
148+50	172.45	2847.16						
			410.49	4730.06	3207370.70	3704904.80	-497534.10	
149+00	230.58	2828.92						
			345.44	4684.11	3207716.14	3709588.91	-501872.77	
149+50	108.57	2792.01						
			227.17	4551.34	3207943.30	3714140.25	-506196.95	
150+00	114.47	2669.60						
			254.35	4225.81	3208197.66	3718366.06	-510168.41	
150+50	135.26	2401.37						
			382.35	3616.77	3208580.01	3721982.83	-513402.82	
151+00	240.14	1938.75						
			702.32	2780.64	3209282.33	3724763.47	-515481.14	
151+50	449.41	1398.01						
			1442.26	2090.75	3210724.58	3726854.22	-516129.63	
152+00	966.62	1110.89						
			2588.25	1735.45	3213312.84	3728589.66	-515276.83	
152+50	1574.57	971.65						
			3817.14	1536.95	3217129.97	3730126.61	-512996.63	
153+00	2173.16	872.69						
			5020.35	1377.03	3222150.33	3731503.63	-509353.31	
153+50	2755.91	779.74						
			6074.40	1189.96	3228224.72	3732693.59	-504468.87	
154+00	3208.05	648.21						
			6608.71	974.94	3234833.44	3733668.53	-498835.09	
154+50	3280.51	521.72						
			6190.02	870.96	3241023.46	3734539.49	-493516.03	
155+00	2796.96	523.43						
			4767.76	952.24	3245791.21	3735491.73	-489700.52	
155+50	1884.11	619.26						

156+00	931.17	936.08	2867.41	1296.11	3248658.62	3736787.84	-488129.22
156+50	514.95	1708.49	1472.89	2203.80	3250131.51	3738991.64	-488860.13
157+00	344.94	2471.08	875.82	3482.97	3251007.33	3742474.61	-491467.28
157+50	230.76	2901.29	586.36	4476.97	3251593.69	3746951.58	-495357.89
158+00	171.62	2980.97	409.83	4901.88	3252003.52	3751853.46	-499849.94
158+50	125.47	2781.16	302.60	4801.77	3252306.12	3756655.24	-504349.12
159+00	575.26	2326.28	713.71	4256.20	3253019.83	3760911.44	-507891.61
159+50	1537.71	1805.83	2152.09	3443.42	3255171.92	3764354.86	-509182.94
160+00	2431.20	1292.41	4042.40	2581.86	3259214.32	3766936.72	-507722.40
160+50	3431.54	537.03	5971.31	1524.53	3265185.63	3768461.25	-503275.63
161+00	4739.85	26.39	8322.71	469.51	3273508.33	3768930.77	-495422.43
161+50	5955.32	0.00	10893.23	21.99	3284401.56	3768952.76	-484551.19
162+00	6892.01	0.00	13085.24	0.00	3297486.80	3768952.76	-471465.95
162+50	7582.21	0.00	14742.26	0.00	3312229.06	3768952.76	-456723.69
163+00	8352.25	0.00	16229.55	0.00	3328458.61	3768952.76	-440494.15
163+50	9205.59	0.00	17882.98	0.00	3346341.59	3768952.76	-422611.16
164+00	9871.21	0.00	19430.07	0.00	3365771.66	3768952.76	-403181.09
164+50	10108.73	0.00	20349.94	0.00	3386121.60	3768952.76	-382831.15
165+00	10100.93	0.00	20583.92	0.00	3406705.52	3768952.76	-362247.24
165+50	11681.70	0.00	22186.01	0.00	3428891.53	3768952.76	-340061.22
166+00	13018.72	0.00	25157.83	0.00	3454049.36	3768952.76	-314903.39
166+25.65	13569.83	0.00	13890.31	0.00	3467939.67	3768952.76	-301013.09
166+50	13853.50	0.00	13639.82	0.00	3481579.48	3768952.76	-287373.27
167+00	14067.08	0.00	28727.39	0.00	3510306.87	3768952.76	-258645.88
167+50	13693.48	0.00	28815.76	0.00	3539122.63	3768952.76	-229830.13
168+00	12509.68	0.00	27392.65	0.00	3566515.28	3768952.76	-202437.47
168+50	11034.75	0.00	24790.18	0.00	3591305.47	3768952.76	-177647.29
169+00	9577.35	0.00	21868.80	0.00	3613174.26	3768952.76	-155778.49
169+50	7923.15	0.00	18693.44	0.00	3631867.71	3768952.76	-137085.05
170+00	6170.65	0.00	15146.98	0.00	3647014.69	3768952.76	-121938.06
170+25.65	5314.58	18.79	6363.97	7.81	3653378.66	3768960.57	-115581.91
170+50	4519.50	100.54	5185.97	45.73	3658564.62	3769006.30	-110441.68
170+58.03	4259.16	142.69	1526.39	30.74	3660091.02	3769037.04	-108946.03
171+00	2927.52	366.48	5784.74	374.76	3665875.75	3769411.80	-103536.05
171+50	1545.12	992.27	4335.96	1185.53	3670211.71	3770597.33	-100385.62
172+00	474.33	2434.64	1975.75	2978.35	3672187.46	3773575.68	-101388.23
172+50	4.32	4660.65	471.49	6116.87	3672658.94	3779692.56	-107033.61
173+00	0.00	7443.76	4.35	10328.39	3672663.29	3790020.95	-117357.66
173+50	0.00	10249.64	0.00	14983.45	3672663.29	3805004.39	-132341.10
174+00	0.00	12809.94	0.00	19410.73	3672663.29	3824415.12	-151751.83
174+50	0.00	14806.64	0.00	23106.24	3672663.29	3847521.36	-174858.08
174+58.03	0.00	15101.17	0.00	4004.15	3672663.29	3851525.51	-178862.22
175+00	0.00	16411.68	0.00	22043.71	3672663.29	3873569.22	-200905.93
175+50	0.00	17778.89	0.00	28492.14	3672663.29	3902061.36	-229398.07
176+00	0.00	18776.65	0.00	30462.95	3672663.29	3932524.31	-259861.02
176+50	0.00	19540.65	0.00	31931.09	3672663.29	3964455.40	-291792.11
177+00	0.00	20192.62	0.00	33111.06	3672663.29	3997566.46	-324903.17
			0.00	33361.39	3672663.29	4030927.85	-358264.56

177+50	0.00	19841.06	0.00	33668.78	3672663.29	4064596.63	-391933.35
178+00	0.00	20561.48	0.00	34204.66	3672663.29	4098801.29	-426138.00
178+50	0.00	20484.11	0.00	32428.34	3672663.29	4131229.63	-458566.34
179+00	0.00	18429.90	0.00	29007.22	3672663.29	4160236.85	-487573.56
179+50	0.00	16378.77	0.00	25761.28	3672663.29	4185998.12	-513334.84
179+98.30	0.00	15623.37					

Segment H

Segment: H

END AREA VOLUME LISTING WITH CURVE CORRECTION									
Station	Cut		Fill		Cut		Fill		Mass Ordinate
	Area (sqft)	Area (sqft)	Volume (yds)	Volume (yds)	Tot Vol (yds)	Tot Vol (yds)	Tot Vol (yds)	Tot Vol (yds)	
0+00	0.00	11115.78	0.00	18816.13	0.00	18816.13	-18816.13		
0+50	0.00	11463.57	0.00	19616.99	0.00	38433.12	-38433.12		
1+00	0.00	12076.81	0.00	21617.74	0.00	60050.85	-60050.85		
1+50	0.00	13864.47	0.00	24678.65	0.00	84729.50	-84729.50		
2+00	0.00	15749.90	0.00	27381.55	0.00	112111.05	-112111.05		
2+50	0.00	17107.96	0.00	29040.18	0.00	141151.23	-141151.23		
3+00	0.00	17740.26	0.00	27875.32	0.00	169026.56	-169026.56		
3+50	0.00	15710.13	0.00	24863.23	0.00	193889.79	-193889.79		
4+00	0.00	14125.75	0.00	21840.28	0.00	215730.07	-215730.07		
4+50	0.00	12082.58	0.00	19094.01	0.00	234824.08	-234824.08		
5+00	0.00	10830.23	0.00	17285.49	0.00	252109.57	-252109.57		
5+50	0.00	9912.36	0.00	15817.67	0.00	267927.24	-267927.24		
6+00	0.00	9068.84	0.00	14249.88	0.00	282177.12	-282177.12		
6+50	0.00	8031.02	0.00	12321.30	0.00	294498.42	-294498.42		
7+00	0.00	6754.54	0.00	10286.68	0.00	304785.10	-304785.10		
7+50	0.00	5589.48	0.00	8359.80	0.00	313144.90	-313144.90		
8+00	0.00	4442.29	0.00	6385.29	0.00	319530.20	-319530.20		
8+50	0.00	3220.06	0.00	5170.57	0.00	324700.77	-324700.77		
9+00	0.00	2984.63	331.83	4365.26	331.83	329066.03	-328734.20		
9+50	325.80	2253.69	1781.62	3272.13	2113.45	332338.16	-330224.71		
10+00	1423.43	1672.86	4018.99	2546.40	6132.44	334884.56	-328752.12		
10+50	2522.49	1382.82	6386.76	2206.13	12519.20	337090.69	-324571.49		
11+00	3748.14	1264.54	2852.87	712.02	15372.07	337802.71	-322430.64		
11+17.49	4259.42	1178.10							