Downtown Parking Lot Redesign

City of Clinton, IA



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Section 1: Executive Summary (Alex)

The purpose of this document is to explain the scope of work, design alternatives, and cost of design for a redesign of five public parking lots in downtown Clinton IA. The project team is a group of four civil engineering students in their senior year at the University of Iowa: project manager Ryan Bartling, Alex Underwood, Christopher Van Horn, and Derek Gansebom. All members of the group had their own unique experiences and expertise that contributed to a resilient design for this project

The project is an improvement of 5 parking areas in downtown Clinton. This included redesigning and reconstructing pavement, grading, lighting, and drainage. In doing this the team explored options to resize the lots to better use the area they are in and improve the aesthetic quality of the downtown area. In addition to updating the lots themselves, a rest area building was designed on the corner of 2nd street and 6th avenue for transit workers. The rest area building contains a bathroom for the workers and a break room to rest and relax. It also has a connected enclosed bus stop for transit riders to use.

The design was carried out over the course of 3 months between February 11th and May 10th, 2022. The design tasks were split amongst the group members with input coming from everyone to establish the best possible design. For this project, the group used several design guides including the Clinton City Code, Statewide Urban Design and Specifications, and the IBC code as well as designing the structure using the LRFD method and National Concrete Masonry Association design guides. These guides, along with correspondence with Karen Rowell, the Director of the Downtown Clinton Alliance and the City of Clinton's engineering staff were the primary resources directing our design.

There were several challenges and constraints that arose as we redesigned the existing parking lots and designed the new rest structure. The primary constraints were the building codes, the inability to expand the size of any of the lots and maintaining the current parking availability and downtown theming of the lots. The main challenges the team faced were improving the aesthetics of the lots without sacrificing usability, incorporating elements of green design to allow for a more sustainable downtown setting, and making the lots more visible.

The expected impacts of this project on the city are primarily improving the community vision and making people's lives easier in the city. There are not expected to be major impacts on the surrounding businesses or the overall population of the city. However, it is expected that the aesthetic improvements will make the downtown area of the city more attractive and inviting to residents and visitors. There are also several factors that will add new features to the areas around the lots such as the rest area and expansion of nearby parks. While there may be some minor inconveniences in the area during the construction, these impacts are significantly outweighed by the positive changes brought about by the revision of the lots.

As far as specific design alternatives are concerned, the team is offering the options of a traditional repaying with asphalt or concrete, a green permeable pavers option, or the most ecological option of incorporating both bio-cells and permeable pavers to help improve drainage on the lots. The inclusion of these green alternatives may have higher initial costs but

could allow for grants to be awarded for the construction of the project, leading to a reduced cost to the city as well as the benefit of a more sustainable design.

After completing our design process, we recommend the bio cell design for all the parking lots. This will allow for the greenest design and best environmental outcome for drainage while still providing excellent aesthetic value to the lots and maintaining an adequate number of parking spaces. This alternative will cost \$19,250,049.01 to construct; however, it is possible that the inclusion of the greener design could open an opportunity for added federal funding.

In summary, the team is excited to present our design to the City of Clinton and begin implementation of this project to help improve the look and feel of downtown Clinton while hopefully instituting a more sustainable design and providing the ease of use and practicality that citizens are used to getting out of their city.

Section 2: Organization Qualifications and Experience (Alex)

Our project manager for this project, Ryan Bartling, can be contacted at <u>ryan-bartling@uiowa.edu</u>. We were senior civil engineering students at the University of Iowa who completed the project for our capstone design class. Our team was made up of 4 members: Ryan Bartling, Alexander Underwood, Christopher Van Horn, and Derek Gansebom.

Ryan was the project manager and specializes in transportation engineering. He took the lead on the design of the parking lot pavement and layout. Alex is the text editor for the project and has a specialization in structures. He led the rest-stop design and the budgeting for that part of the project. Christopher is the graphics editor and specializes in water resource engineering. He took the lead on drainage design for the lots along with the exploration of green design alternatives. Finally, Derek is our tech specialist and specializes in traffic engineering. He took the lead on the traffic design aspects of the lots as well as the lighting.

The members of our team each have project experience in the past four years which has prepared us for this project. All members of the team have experience through class projects designing parking lot layout and dimensions while adjusting for drainage and usability. Ryan has worked in the asphalt industry as an engineering tech intern for 3 summers where he would go out to project sites, survey the existing lots or roadways, redesign a surface that either maintained or improved the drainage, and conveyed the information to the construction crews. Alex has worked as an engineering consultant inspecting concrete pours and grading while working with detailed site design drawings.

Section 3: Proposed Services (Derek)

1. Project Scope

The project involved improving 5 parking areas in downtown Clinton, Iowa. The main goals of the project included bringing all parking areas up to current applicable codes and standards, improving the overall aesthetic of the parking areas, improving the drainage, improving the capacity and functionality of the lots, resizing, and using the excess space to improve public spaces, producing a naming system for the lots, and designing bio-cells for outside funding. The project also added a rest area building at the lot at South 2nd street and 6th street for the transit workers which includes bathrooms and a break area.

2. Work Plan

Gantt Chart



https://iowa.sharepoint.com/:x:/s/BartlingDesign/EfH1bhSrjQJJgwMrypJqHAMBa44OGyi4A4qH d4NWwMyLnw?e=WQTRfX

3. Methods and Design Guides

Parking Lots

As for the design of the parking lot, we used the Clinton city code, SUDAS standards, and the International Building Code (IBC). We spoke with Karen Rowell, the Director of the Downtown Clinton Alliance, along with the Transit Director and engineering staff at the City of Clinton, to get a greater understanding of Clinton's needs and desires for the design of all aspects of the five parking lots and the public that they service.

The design included:

- 1) Green design
 - a) Alternative water retention/filtration methods
 - i) Bio cells

- b) Alternative finished surfaces
 - i) PCC
 - ii) HMA
 - iii) Permeable Pavers
- c) Alternative landscaping
 - i) Shade trees
 - ii) Historic foliage
 - iii) Foliage known to remove toxins from water
- 2) Public Needs
 - a) Parking space equivalent to area needs
 - i) Alternative Park and Ride locations
 - ii) Cut of street section to parking space conversions.
 - b) Pedestrian Safety
 - i) Lighting
 - ii) Sidewalks
 - iii) Bus stop location
 - iv) Crosswalks
 - c) Traffic safety
 - i) Sight distance
 - ii) Setbacks
 - iii) Traffic delineation
- 3) Aesthetic Functionality
 - a) Multi seasonal use surfaces
 - b) Attract the community to come outside
 - c) Attract other people to Clinton, Iowa

Rest Area Building

As for the design of the MTA rest area building, we used the LRFD method to determine the design and ultimate loads, the International Building Code (IBC), and the minimum design load standards of the American Society of Civil Engineers (ASCE). The main contact within the City of Clinton for the design of this building was Dennis Hart. Along with Dennis, the other engineering staff for the City of Clinton and the Director of the Downtown Clinton Alliance helped with giving us an understanding of the needs for this part of the project.

The design included:

- 1) Transit Worker Functionality
 - a) Restroom
 - b) Common Lounge
- 2) Public Functionality
 - a) Enclosed bus stop
 - b) Glass Windows
 - c) Benches

- 3) Aesthetic Functionality
 - a) Congruent with Downtown theme

Section 4: Constraints, Challenges, and Impacts

1. <u>Constraints</u>

The constraints of the project are that the lots cannot be made larger, the functionality of the lots must be maintained or improved, the city has a downtown color theme, and the lots must adhere to all applicable codes. As for the MTA building, the main constraint was providing all the rooms that the city had requested while remaining of an appropriate size in the Oriole lot.

Another constraint was finding a way to add funding from outside the city budget. The way we chose was to include catchments that retarded the first inch of water or first wash to improve stormwater return to the watershed. The constraints to do this were a deep enough water table and a native soil with poor absorption.

2. Challenges

The challenges of the project are improving aesthetics while maintaining the functionality of the lots, adding a new building to one of the lots, and making the lots more accessible and well known to the public. The MTA building presented its own challenges of matching surrounding architecture while incorporating a combination of construction materials. To include catchments without adding major infrastructure and to still allow snow storage.

3. Societal Impact

Population Characteristics: We believe our improvements to the 5 parking lots in downtown Clinton will have no impact on the characteristics of the population since there will not be any dimensional changes of the lots requiring additional land use.

Community and Institutional Structures: We believe our improvements to the 5 parking lots in downtown Clinton will have no impact on the patterns of employment or industrial diversity since we are not changing the dimensions or land use of the parking lots. There may be a temporary impact during construction.

Individual and Family Changes: We believe that our improvements to the 5 parking lots in downtown Clinton will have an impact on individuals and families living in the Clinton area. The impacts are as follows: improved downtown aesthetics making it more enjoyable for the public, improved lighting to make the parking lots safer at night, improved working conditions for the city transit workers, as well as a more enjoyable parking experience. The only negative impact will be temporary and during construction of the lots.

Personal and Property rights: We believe that our improvements to the 5 parking lots in downtown Clinton will have an overall good impact on people since it will make the parking areas and the downtown of Clinton more aesthetically pleasing and useful to the public. However, during construction, there will be a temporary negative impact.

Community Resources: We believe our improvements to the 5 parking lots in downtown Clinton will have an overall good impact since it will make the parking lots more usable and appealing to the public. During construction there will be a temporary negative impact since people will not be able to use the lots until they are complete.

Section 5: Proffer of Alternative Solutions

During the overview of the site and the scope of the project, our team envisioned a few different alternatives. To start we designed the lots for both use of hot mix asphalt pavement (HMA) and Portland Cement Concrete pavements (PCC). After meeting with the client, they made it apparent that they were looking for outside funding for the lots. This led us to produce a design of the lots using "green" materials and systems. There is a large amount of funding available to projects using more eco-friendly materials and technologies. We offered a design of each lot based on the following: PCC pavement, HMA pavement, HMA pavement with permeable pavers, PCC pavement with permeable pavers around a bio cell, and finally ACC pavement with permeable pavers around a bio cell to help reduce runoff and give a design for traditional lighting. In the design of the MTA building, there were less explicit alternatives available for construction as the city was clear that they wanted the main structural material to be CMU blocks. However, there were several iterations of the architectural layout of the building that were changed to match the vision and goals for the building's use.

Section 6: Final Design Details

Rest Area and Bus Stop Building Design

One of the main parts of the project was to design a structure at one of the lots that could be used as a rest area for the city transit workers and feature an enclosed bus stop for transit riders to use during cold or rainy weather. The following are the steps taken to complete the design.

First, the design loads for the structure were calculated according to ASCE 7-16 standards and ASD load combinations. This gave us the design loads that would be used for the structural design of the building. Detailed calculations and the full load list can be found in appendix A-1

The next task was to design a strip foundation to support the walls of the building. Using Terzaghi's method for bearing capacity as laid out in *Foundation Design – Principles and Practices*, it was determined that a one-foot thick and 18-inch-wide strip foundation would be sufficient. Based on previous designs of similar public structures and boring logs from the surrounding area, a depth of 5ft for the foundation base was considered adequate. A floor slab was also designed to function as the structural hold for the first floor with a depth of 8.5 inches and #4 rebar at 9" OC each way. Detailed calculations for this slab can be found in Appendix A-1 and a section view can be found on sheet G5 of the design plans.

Next, the Concrete Masonry Unit (CMU) wall was designed based on the National Concrete Masonry Association design guides and tables. It was determined that a 1500 psi 8"x8"x16" CMU block with #4 rebar placed every 120" OC would be adequate for the vertical and horizontal loads on the structure. The walls would also use Type S mortar and the cells will be filled at each location where rebar is placed. Detailed calculations for the wall ca be found in appendix A-1 and a section view can be seen on sheet G5.

The final structural element of the design was the roof trusses. This design was based primarily on the *Encyclopedia of Trusses* handbook and design guide. The geometry of the roof was designed as a hip roof, so terminal hip framing was decided – due to the small spans- for the ends of the roof. While several different span lengths will be required for the full construction of the roof, a simple Fink truss configuration would be used for each, and spans ranging from 16' to 24' will be utilized in the roof at 2' OC spacing. A TBE6 truss connector would be used to anchor the trusses to the wall to prevent uplift. The full truss design calculations can be found in Appendix A-1 and a view of the truss can be seen on sheet G3 with a detailed view of the truss-to-wall connection on sheet G5.

With these structural elements set, the next issue to solve was the layout for the interior of the building. There were several potential layouts suggested over the course of the design, but the final design attributes the largest areas to the rest area room for the transit workers and the enclosed bus stop. The bathroom was sized and oriented I order to meet the ADA requirements for a single-user bathroom, and this led to one challenge of how to orient doors, the sink, the toilet, etc. In the end, the best layout for the bathroom placed the plumbing onto exterior facing walls, so those walls were designed with added insulation to protect the pipes from freezing. Finally, the sizing of the AC and heating units was based on the RS means

recommendations based on the square footage of the area to be heated and cooled. The final layout of the structure can be seen on sheet G3 of the plan sheets.

Goldfinch Parking Lot

For the design of the Goldfinch Lot, we started out by creating three two dimensional layouts of the parking lot. This included a design for 90-, 60-, and 45-degree parking stalls. After reviewing with the client, they decided they liked the 60-degree layout with the removal of small island areas to make snow removal easier. Overall, the new layout includes the new MTA building in the SW corner of the lot, a 5-foot sidewalk that surrounds the building, 1 large island in the center of the lot, two medium islands in the NW and NE corner of the lot, 48 nine by eighteen parking stalls, 2 van handicap accessible stalls, and an 8-foot landing between the handicap stalls. Before we made changes, the lot was totally paved without any island areas with 48 parking stalls and 4 handicap stalls. We have also improved the lighting of the parking lot by designing the lights to be brighter than before to enhance security within the lot itself.

For the materials and grading of the lot there were 3 different alternatives offered. The first was a traditional material and grading scheme. For this design, the lot was to be covered in either 6 inches of PCC or HMA on top of 12 inches of granular subbase. For the grading there are two area intakes proposed to the north and south of the large central island. These intakes are in the center of the drive lanes to keep cars from running over them causing unnecessary wear to the vehicles and intakes. The grades going to the intakes are approximately 1.4% and that satisfies all SUDAS and ADA requirements for the parking lot.

For the permeable design, the parking stalls will be covered in permeable pavers. This helps with storm water runoff and opens the opportunity for additional funding. The drive lanes will match the traditional designs thickness for PCC or HMA. The grading of this lot was a bit trickier since the water was going to not only the center of the lot, but the four outer edges as well. Eventually we produced a scheme that had the center of the parking lot match the 1.4% grades of the traditional design, but the very westerly and easterly edge have grades of approximately 2.7%. The ADA stalls are in the center of the lot so overall the parking lot still meets the SUDAS and ADA grading requirements.

Finally, the bio cell design, the center island was converted from a traditional island to an engineered bio cell and the curb surrounding it was also removed. We decided to leave permeable pavers around the bio cell to help absorb the parking lot runoff. The rest of the parking lot will match the PCC or HMA thicknesses of the traditional design. The grading was simple on this lot as well since the water only goes to the very center of the lot. These grades are about 1.4% meeting all SUDAS and ADA requirements.

For the design of the storm sewer systems, we referenced SUDAS chapter 2. Using the hydro analysis tools on Civil3D and a 5-year design storm, we calculated the peak flow rates per drainage area on the parking lot designs. Since this is a preliminary design, we are sizing the pipes based off the minimum flow velocity of 3 fps as stated in SUDAS chapter 2. This will have to be reevaluated once the connection points and inverts of the cities existed storm sewer are known.

For the design of the lighting, we are going to use 25-foot-tall poles and using SUDAS chapter 11 we choose factors based on the materials and level of security we wanted. Using the provided equation, we found the rough lumens needed to illuminate the area. We then went to a light manufacturer (Cree Lighting) and found a light that about matched the required lumens. Using more specific data about the light offered by the manufacturer we reentered the information into the equation to get the light spacing. After a few iterations of changing types of lights, we got the final spacing.

Oriole Parking Lot

For the design of the Oriole Lot, we started out by creating three two dimensional layouts of the parking lot. This included one design for 90-degree stalls and two designs with 45-degree parking stalls. All three of the designs incorporated different amounts of green space. After reviewing with the client, they decided for the western portion of the lot that they liked the 45-degree layout with a long and narrow island down the center of the lot and the removal of small island areas to make snow removal easier. For the portion of the lot east of the railroad tracks, they decided they like the design with 45-degree angled spots with a long and narrow island along the eastern edge of the lot. Overall, the new layout includes 1 large island in the center of the lot for the portion of the lot on the western side of the railroad and an island along the eastern edge of the lot on the lot east of the railroad and an island along the eastern edge of the lot on the lot east of the railroad and an island along the eastern edge of the portion of the lot east of the railroad. The lot contains a total of 147 nine by eighteen parking stalls, 4 van handicap accessible stalls, and an 8-foot landing between the handicap stalls. Before we made changes, the lot was totally paved with 146 regular parking stalls and 4 handicap stalls. We have also improved the lighting of the parking lot by designing the lights to be brighter than before to enhance security within the lot itself.

For the materials and grading of the lot there were 3 different alternatives offered. The first was a traditional material and grading scheme. For this design, the lot was to be covered in either 6 inches of PCC or HMA on top of 12 inches of granular subbase. For the traditional design there are four area intakes proposed on both sides of the large central island for the portion of the lot west of the railroad. The traditional design for the portion of the lot east of the railroad includes an additional 2 area intakes west of the island that runs along the eastern edge of the lot. These intakes are in the center of the drive lanes to keep cars from running over them causing unnecessary wear to the vehicles and intakes. The grades going to the intakes are approximately 1.4% and that satisfies all SUDAS and ADA requirements for the parking lot.

For the permeable design, the parking stalls will be covered in permeable pavers. This helps with storm water runoff and opens the opportunity for additional funding. The drive lanes will match the traditional designs thickness for PCC or HMA. The grading of this lot was a bit trickier since the water was not going towards intakes but rather, the 7 different parking spot areas. Eventually we produced a scheme for both portions of the lot that has a maximum grade of 1.4%, which matches the maximum of the traditional design. The ADA stalls are in the northwestern corner of the lot, so the parking lot meets the SUDAS and ADA grading requirements.

Finally, for the bio cell design, the center island was converted from a traditional island to an engineered bio cell and the curb surrounding it was also removed. Two islands were added to the southern corners of the lot on the western side of the railroad; these islands will be bio cells. The island for the lot east of the railroad will also be converted from a traditional design to an engineered bio cell. We decided to keep the permeable pavers in the locations surrounding the bio cells to help absorb the parking lot runoff. The rest of the parking lot will match the PCC or HMA thicknesses of the traditional design. The grading was simple on this lot as well since the water only goes to the islands of the lot. These grades are about 1.4% meeting all SUDAS and ADA requirements.

For the design of the storm sewer systems, we referenced SUDAS chapter 2. Using the hydro analysis tools on Civil3D and a 5-year design storm, we calculated the peak flow rates per drainage area on the parking lot designs. Since this is a preliminary design, we are sizing the pipes based off the minimum flow velocity of 3 fps as stated in SUDAS chapter 2. This will have to be reevaluated once the connection points and inverts of the cities existed storm sewer are known.

For the design of the lighting, we are going to use 25-foot-tall poles and using SUDAS chapter 11 we choose factors based on the materials and level of security we wanted. Using the provided equation, we found the rough lumens needed to illuminate the area. We then went to a light manufacturer (Cree Lighting) and found a light that about matched the required lumens. Using more specific data about the light offered by the manufacturer we reentered the information into the equation to get the light spacing. After a few iterations of changing types of lights, we got the final spacing. The Oriole lot will have a combined 18 lights between the portions of the lot on both sides of the railroad.

Chickadee Parking Lot

For the design of the Chickadee Lot, we started out by creating three two dimensional layouts of the parking lot. This included one design for 90-degree stalls and two designs with 45-degree parking stalls. All three of the designs incorporated different amounts of green space. After reviewing with the client, they decided they like the design with a large island in the center of the lot and the removal of small island areas in each of the corners. The reasoning behind removing the small corner islands is to help make snow removal easier. Overall, the new layout is a one-way and includes 1 large island in the center of the lot with entrances and exits on the northern edge of the lot. The Chickadee Lot contains a total of 34 nine by eighteen parking stalls, 2 van handicap accessible stalls, and an 8-foot landing between the handicap stalls. Before we made changes, the lot was totally paved with 48 regular parking stalls and 2 handicap stalls. The reduction in the number of parking stalls is due to a significant increase in green space within the lot. The city decided that incorporating more green space was important for this lot. We have also improved the lighting of the parking lot by designing the lights to be brighter than before to enhance security within the lot itself.

For the materials and grading of the lot there were 3 different alternatives offered. The first was a traditional material and grading scheme. For this design, the lot was to be covered in either 6 inches of PCC or HMA on top of 12 inches of granular subbase. For the traditional design there are 2 area intakes proposed on both sides of the large central island. These intakes are in the center of the drive lanes to keep cars from running over them causing unnecessary wear to the vehicles and intakes. The grades going to the intakes are approximately 1.9% and that satisfies all SUDAS and ADA requirements for the parking lot.

For the permeable design, the parking stalls will be covered in permeable pavers. This helps with storm water runoff and opens the opportunity for additional funding. The drive lanes will match the traditional designs thickness for PCC or HMA. The grading of this lot was a bit trickier since the water was not going towards intakes but rather, the 5 different parking spot areas. Eventually we produced a scheme for both portions of the lot that has a maximum grade of 1.9%, which matches the maximum of the traditional design. The ADA stalls are in the northwestern corner of the lot where the maximum grade is 1.4%, so the parking lot meets the SUDAS and ADA grading requirements.

Finally, for the bio cell design, the center island was converted from a traditional island to an engineered bio cell and the curb surrounding it was also removed. We decided to keep the permeable pavers in the locations surrounding the centrally located bio cell to help absorb the parking lot runoff. The rest of the parking lot will match the PCC or HMA thicknesses of the traditional design. The grading was simple on this lot as well since the water only goes to the central island of the lot. These grades are about 1.4% meeting all SUDAS and ADA requirements.

For the design of the storm sewer systems, we referenced SUDAS chapter 2. Using the hydro analysis tools on Civil3D and a 5-year design storm, we calculated the peak flow rates per drainage area on the parking lot designs. Since this is a preliminary design, we are sizing the pipes based off the minimum flow velocity of 3 fps as stated in SUDAS chapter 2. This will have to be reevaluated once the connection points and inverts of the cities existed storm sewer are known.

For the design of the lighting, we are going to use 25-foot-tall poles and using SUDAS chapter 11 we choose factors based on the materials and level of security we wanted. Using the provided equation, we found the rough lumens needed to illuminate the area. We then went to a light manufacturer (Cree Lighting) and found a light that about matched the required lumens. Using more specific data about the light offered by the manufacturer we reentered the information into the equation to get the light spacing. After a few iterations of changing types of lights, we got the final spacing. The Chickadee lot will have 8 lights within the lot which will significantly increase the amount of light from what is currently in place.

Blue Jay Parking Lot

The Blue Jay parking lot had the unique challenges of determining appropriate parking spaces, and what to do with the unused portions of the existing parking lot. During the first meeting

with our Clinton representative, it was abundantly clear that extra funding ideas, greenspace, sufficient lighting, and a design to match with the rest of the city of Clinton were also important.

The original lot had over two hundred parking spaces consisting of several rows with driveways on both ends. Several methods existed to determine the correct number of spaces. The method used was to count the structural use surrounding the park and multiply that number by 2. The second method was to just divide what was there in half. The average results were around 100 spaces.

The number of spaces gives the space needed for the design. The first three designs all consisted of a north driveway and a east driveway. These designs were provided to Clinton and the aspects of the designs that they liked were transferred to the fourth design. This design consisted of only one driveway for two-way traffic on the north side of the parking lot. Two more criteria were added: the lot ran from the restrooms in the park east and the green space was smaller.

Now that the design outline was complete the next task was to find the catchment area and design permeable space, add ADA accessibility, and determine the best way to drain the lot. Storage was determined through using the ISWMM (Iowa Stormwater Management Manual) chapter 5 calculation method. The permeable pavement of brick hatch was chosen to match the rest of Clinton and given all constraints for rain gardens were met a modified rain garden was designed for the central position of the parking lot.

Drainage for this parking lot in this manner matched the existing storm water management system that the old lot utilized. Small alterations to the existing drainage system such as putting a maintenance hole on top of the south drain and raising the north drain, saving the city a lot of money. Initial designs capped both drains, but after a micro storm dropped over 13 inches in a spot in less than an hour it became apparent that with current weather trends, that a overflow was needed to prevent lot flooding.

Alternative designs using different pavements were redundant as the slope of the lot and the location makes the change in materials a mathematical change and not a design one. These figures are provided with the blueprints for this lot. The change in size of the lot returned 0.12 acres of land to the parks department.

For the design of the lighting, the use of 25-foot-tall poles and using SUDAS chapter 11 to choose factors based on the materials and level of security desired. Using the provided equation, we found the rough lumens needed to illuminate the area. We then went to a light manufacturer (Cree Lighting) and found a light that about matched the required lumens. Using more specific data about the light offered by the manufacturer we reentered the information into the equation to get the light spacing. After a few iterations of changing types of lights, we got the final spacing. The lot will have ten lights within the lot which will significantly increase the amount of light from what is currently in place.

Grackle Parking Lot

The design of this lot was based on water flow and parking angle. The city of Clinton wanted the lot to have 90-degree parking stalls and a matching stormwater management system to the rest of the city. The removal of the crumbling existing lot and sidewalks was necessary but creates a unique situation. The lot is small and buts up against a structure with open businesses, has two power poles in the northwest corner and connects to concrete sidewalks on the south side that must be preserved.

The design choice of permeable pavement in a brick hatch comes from matching the same materials used in other lots and it allows for the removal of the chemicals in the first inch of rain. This catchment unlike the other designs above has a French drain at the bottom that runs north to the existing storm water management system in the alley providing a lot drain that does not require costly new infrastructure.

The final design was PCC with a 5 ft sidewalk running along with the existing structure for business access. The permeable pavement is designed (see sheet F4) for a 2-year storm based on NOAA rain rates for the Clinton area.

For the design of the lighting, the use of 25-foot-tall poles and using SUDAS chapter 11 to choose factors based on the materials and level of security desired. Using the provided equation, we found the rough lumens needed to illuminate the area. We then went to a light manufacturer (Cree Lighting) and found a light that about matched the required lumens. Using more specific data about the light offered by the manufacturer we reentered the information into the equation to get the light spacing. After a few iterations of changing types of lights, we got the final spacing. The lot will have three lights within the lot which will significantly increase the amount of light from what is currently in place.

Sidewalk Design

For the sidewalk we referenced SUDAS chapter 12. From this we found the minimum required thickness was 4 inches. The minimum cross slope is 0.5% and the maximum cross slope is 5% while the maximum running slope is 8.3%. We also found the minimum width had to be at least 5 foot wide for the sidewalks.

For the storm runoff calculations, we used chapter 5 of the ISWMM. The formulas used parking lot area, 100-year design storm, concentration time, and surface permeability. These parameters that we used will be attached in the appendices.

Bio cell and Permeable Paver Design

See ISWMM chapter 5.

Section 7: Engineers Cost Estimate (RYAN)

The cost estimate for this project is complex. There are 5 separate lots, each with 3 separate designs, each with 2 alternatives for the pavement. This gives us 30 different cost breakdowns. I am going to start by doing the overall project cost based on the recommended design. The total per lot does contain a 10% contingency amount (see detailed cost breakdown per lot). The building total does contain a 20% contingency as shown (see detailed cost breakdown for building) After those 6 tables are done there will be each individual table per lot, design, and alternative to look at as well as the building cost breakdown in the appendices. We used the lowa DOT Bid letting of April 2022 and January 2022 for the cost estimation of the parking lot materials. We used the RS Means data from 2011 for the building cost estimation. This data was converted to reflect the current construction costs by using inflation. The unit costs include furnishing the materials, installing them, labor, and equipment used in construction. There will also be a 20% engineering and administrative fee as can be seen in the recommended design table.

Overall Costs for Project	Biocell Des	ign with PCC	C - Grackle Permeable PCC
ltem	Unit	Qty	Cost
Mobilization	LS	1	\$ 7,500.00
Erosion Control	LS	1	\$ 500.00
Traffic Control	LS	1	\$ 500.00
Pavement Striping	LS	1	\$ 3,000.00
Goldfinch Lot	LS	1	\$ 256,000.00
Chickadee Lot	LS	1	\$ 261,000.00
Oriole Lot	LS	1	\$ 820,500.00
Bluejay Lot	LS	1	\$ 620,000.00
Grackle	LS		\$ 73,000.00
New MTA Building			
(Golfinch Lot)	LS	1	\$ 134,000.00
Subtotal with contingency			\$ 2,176,000.00
Engineeringł			
Administrative Fees		20%	\$ 435,200.00
Total Project Cost			\$ 2,611,200.00
Pavement Striping Goldfinch Lot Chickadee Lot Oriole Lot Bluejay Lot Grackle New MTA Building (Golfinch Lot) Subtotal with contingency Engineering / Administrative Fees Total Project Cost	LS LS LS LS LS LS	1 1 1 1 1 20%	\$ 3,000.00 \$ 256,000.00 \$ 261,000.00 \$ 820,500.00 \$ 620,000.00 \$ 73,000.00 \$ 134,000.00 \$ 2,176,000.00 \$ 2,611,200.00

Appendix A Rest Area/Bus Stop Design

A.1 Design Calculations

Building Load Calculations:	
First Floor DL:	First Floor LL: 50psf in breakroom, 40psf in bathroom
6in conc slab= 48psf	
3/4in subfloor= 3psf	
1/2in linoleum= 2psf	
53psf	
Upper Roof DL:	Roof LL: 20psf
framing= 5psf	
1/2" OSB= 1.7psf	
waterproof membrane= 0.7psf	
asphalt shingles= 2psf	
10psf	
Lower Roof DL:	
20" blown-in insulation= 2.8psf	
5/8in gypsum board= 2.8psf	
MEP= 4pst	
10psf	
Wind load: risk category 2, and expo	osure B
V := 115 mph $kd := 0.85 ke := 1$	kzt := 1 $kz := 0.575$ $GCpi := 0.18$ $G := 0.85$
$cpww \coloneqq 0.8$ $cplw \coloneqq -0.5$ $cpside$	=-0.7
$qh \coloneqq 0.00256 \cdot kz \cdot kzt \cdot ke \cdot kd \cdot (115)$	² • psf = 16.547 psf
$pww \coloneqq qh \cdot G \cdot cpww - qh \cdot GCpi = 8.$	274 psf
$plw := qh \cdot G \cdot cplw - qh \cdot GCpi = -10$.011 psf
$pside := qh \cdot G \cdot cpside - qh \cdot GCpi = -$	-12.824 psf
cproof 1p := -0.9 $cproof 2p := -0.5Neg internal:$	cproofnww := -0.9 $cproofnw := -0.18$
$proofnww \coloneqq qh \boldsymbol{\cdot} G \boldsymbol{\cdot} cproofnww + qh$	•GCpi=-9.68 psf
$proofnlw \coloneqq qh \cdot G \cdot cproofnlw + qh \cdot G$	GCpi=0.447 psf
$proofp1 := qh \cdot G \cdot cproof1p + qh \cdot GC$	$p_i = -9.68 \ ps_f$
$proofp2 \coloneqq qh \cdot G \cdot cproof2p + qh \cdot GC$	$p_i = -4.054 \ ps_f$
Pos internal:	
$proofnww := qh \cdot G \cdot cproofnww - qh$	•GCpi=-15.637 psf
$proofnlw := qh \cdot G \cdot cproofnlw - qh \cdot G$	GCpi = -5.51 psf
$proofp1 \coloneqq qh \cdot G \cdot cproof1p - qh \cdot GC$	$pi = -15.637 \ psf$
$proofp2 \coloneqq qh \cdot G \cdot cproof2p - qh \cdot GC$	$pi = -10.011 \ psf$
cpoverhang := -0.8	
$poverhang \coloneqq qh \cdot G \cdot cpoverhang = -$	11.252 psf
Snow Load:	
$Pg \coloneqq 26 \text{ psf}$ $Ce \coloneqq 1$ $Ct \coloneqq 1$ $Is \coloneqq$	1 $Cs \coloneqq 1$ $Ps \coloneqq 0.7 \cdot Ce \cdot Ct \cdot Is \cdot Pg \cdot Cs \equiv 18.2$ psf

Using Vesic's method for bearing capacity and the information provided by the city, it was calculated that a strip footing of width 1'6" and depth of 5ft would be sufficient for our structure. The in situ unit weight of the soil was estimated at 100pcf based on engineering judgement and conservative estimation.

 $N1 := 3 \cdot 0.55 \cdot 1 \cdot 1 \cdot \frac{1}{0.6} = 2.75 \quad B := 1.5 \ \text{ft} \ y fill := 120 \ \text{pcf} \quad D := 5 \ \text{ft} \quad ysitu := 100 \ \text{pcf}$

 $wd \coloneqq 125 \ pcf \cdot 8 \ in \cdot 10 \ ft + 53 \ psf \cdot 7.5 \ ft + 20 \ psf \cdot 7.5 \ ft + 150 \ pcf \cdot 4 \ ft \cdot 1 \ ft + 150 \ pcf \cdot B \cdot 1 \ ft$

$$wl \coloneqq 50 psf \cdot 7.5 ft$$
 $wrl \coloneqq 20 psf \cdot 7.5 ft$

$$w := wd + wl + wrl = 2.731$$
 klf $q := \frac{w}{r} + 4$ ft · yfill = 15.976 psi

 $N160 \coloneqq 2.75 \cdot \sqrt{\frac{2000 \text{ psf}}{\text{ysitu} \cdot D}} = 5.5 \qquad phi' \coloneqq \sqrt{20 \cdot N160} \text{ deg} + 20 \text{ deg} = 30.488 \text{ deg}$

 $Nq = 2.718^{\pi \cdot \tan{(phi)}} \cdot 4.356 = 27.689$ $k = \operatorname{atan}\left(\frac{D}{(B)}\right) = 1.279$

 $Ny := 2 \cdot (Nq+1) \cdot \tan(phi') = 33.782 \qquad dq := 1 + 2 \cdot k \cdot \tan(phi') \cdot (1 - \sin(phi')) = 1.742$

dy := 1 iq := 1 iy := 1 sq := 1 sy := 1 y := ysitu - 62.4 pcf $\sigma zd := ysitu \cdot D = 500$ psf

 $qall \coloneqq \sigma zd \cdot Nq \cdot sq \cdot dq \cdot iq + 0.5 \cdot y \cdot B \cdot Ny \cdot sy \cdot dy \cdot iy = 174.107 \text{ psi}$

Calculations for selection of CMU block:

Using standard dimensions of CMU blocks and the calculations below, I was able to decide on a block 16" long, 8" tall, and 8" wide with #4 rebar spaced every 120" on center. Type S mortar will be used in the blocks only in the blocks where the rebar is placed. This design was based on the NCMA design guide for CMU small-rise buildings.

p_wind_max = 13 psf

Using table 1 in section 14-19B of the NCMA CMU design guide, I was able to interpolate for our wall height of 10ft and a block width of 8 inches a maximum shear force and moment:

Vmax := 65 plfMmax := 2030 lb $\cdot \frac{in}{ft}$ Using table 3A in the same section, it was determined
that #4 rebar at 120" O.C. was sufficientFrom these calcs and the dimensions given in section 14-01B table 3b of the design guide I
was able to determine the following allowable bearing pressure:
As := 0.02 in 2 h := 8 in r := 2.76 in An := 1 in $\cdot 7.625$ in = 7.625 in 2 Fs := 32000 psi

fm':=1500 psi

 $Pa := \left(0.25 \cdot fm' \cdot An + 0.65 \cdot As \cdot Fs\right) \cdot \left(1 - \left(\frac{h}{140 \cdot r}\right)^2\right) = 3.274 \text{ kip}$ $P := \left(20 \text{ psf} + Ps \cdot 0.75 + 20 \text{ psf} \cdot 0.75\right) \cdot 2.5 \text{ ft} \cdot 7.5 \text{ ft} = 0.912 \text{ kip}$

Calculations for Roof Truss:

The load on the roof truss will be calculated using DL+0.75*LL and using a 2ft truss spacing:

 $wroof := (20 \ psf + 20 \ psf \cdot 0.75) = 35 \ psf$ $span := 16 \ ft$

Basic Alpine fink truss with 2"x4" top and bottom chords with 2 ft OC spacing and our slope of 4"/12" are rated for 40psf at a span of 46 ft., more than enough for our 16ft span. These can also be made with a 2' overhang.

Total needs:

3 standard 16' trusses with overhang on both ends

4 standard 16' trusses clipped on one end.

- 2 terminal hip set 16' span, overhang both ends
- 1 terminal hip set 16' span, overhang one end
- 1 set of 4 valley frames

1 16' girder.

 $Uplift := proofp1 + 0.6 \cdot (10 \text{ psf} + 10 \text{ psf}) = -3.637 \text{ psf}$

anchor_force := Uplift $\cdot 2 \ \mathbf{ft} \cdot \frac{span}{2} = -58.192 \ \mathbf{lbf}$ bearing := wroof $\cdot 2 \ \mathbf{ft} \cdot \frac{span}{2} = 560 \ \mathbf{lbf}$

Using the Simpson Strong-Tie Wood Construction Connectors Catalogue, two TBE6 connector will be sufficient for resisting uplift and bearing failure.

First Floor Slab:

Longest span size is 15'x20'8". Use #4 rebar at 9" O.C. both ways with 1.5" clear cover. Use 4000psi strength concrete and grade 60 rebar



Appendix B Detailed Cost Estimation Parking Lots

Lot	Design	Alte	ernative			
Grackle	Permeable	HM	A			
ltem	Unit	Uni	t Cost	Qty	Cost	
Commerical HMA 6 in	Ton	\$	186.51	195.46	\$	36,455.24
Sidewalk 4in	SY	\$	50.28	27.1555556	\$	1,365.38
Topsoil	CY	\$	25.11	0	\$	-
6 in Curb & Gutter	LF	\$	40.01	200	\$	8,002.00
Removal of Pavement	SY	\$	8.90	945	\$	8,410.50
Excavation Class 10	CY	\$	6.95	418.89	\$	2,911.29
Seeding and Fertilization	AC	\$ 3	3,439.47	0	\$	-
ADA Parking Sign	EA	\$	200.00	1	\$	200.00
Perforated Subdrain 6 in	LF	\$	14.65	0	\$	-
Storm Sewer 8 in PVC	LF	\$	19.20	10	\$	192.00
Storm Sewer 24 in PVC	LF	\$	72.73	0	\$	-
Permeable Pavement	SY	\$	102.15	25.9222222	\$	2,647.96
Materials & Labor					\$	60,184.37
Contingency				10%	\$	6,018.44
Total					\$	66,000.00
Lot	Design	Alt	ernative			
Grackle	Permeable	PCC	:			
	i chine and re-			1		
	. cincobic					
Item	Unit	Uni	it Cost	Qty	Cost	
Item Driveway PC Concrete 6 in	Unit	Uni \$	it Cost 60.72	Qty 700	Cost \$	42,504.00
ltem Driveway PC Concrete 6 in Sidewalk 4in	Unit SY SY	Uni \$ \$	it Cost 60.72 50.28	Qty 700 27.1555556	Cost \$ \$	42,504.00 1,365.38
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil	Unit SY SY CY	Uni S S	it Cost 60.72 50.28 25.11	Qty 700 27.1555556	Cost \$ \$ \$	42,504.00 1,365.38
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter	Unit SY SY CY LF	Uni S S S S	it Cost 60.72 50.28 25.11 40.01	Qty 700 27.1555556 200	Cost \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement	Unit SY SY CY LF SY	Uni S S S S S	it Cost 60.72 50.28 25.11 40.01 8.90	Qty 700 27.1555556 200 945	Cost S S S S S	42,504.00 1,365.38 - 8,002.00 8,410.50
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	Unit SY SY CY LF SY CY	Uni \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95	Qty 700 27.1555556 200 945 418.89	Cost S S S S S S S	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization	Unit SY SY CY LF SY CY AC	Uni \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47	Qty 700 27.1555556 200 945 418.89 0	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign	Unit SY SY CY LF SY CY AC EA	Uni \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00	Qty 700 27.1555556 200 945 418.89 0 1	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign Perforated Subdrain 6 in	Unit SY SY CY LF SY CY AC EA LF	Uni \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00 14.65	Qty 700 27.1555556 200 945 418.89 0 1 1	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00 -
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC	Unit SY SY CY LF SY CY AC EA LF LF	Uni \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00 14.65 19.20	Qty 700 27.1555556 200 945 418.89 0 1 1 0 10	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00 - 192.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 24 in PVC	Unit SY SY CY LF SY CY AC EA LF LF LF	Uni S S S S S S S S S S S S S S	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00 14.65 19.20 72.73	Qty 700 27.1555556 200 945 418.89 0 1 1 0 10 0	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00 - 192.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 24 in PVC Permeable Pavement	Unit SY SY CY LF SY CY AC EA LF LF LF LF SY	Uni S S S S S S S S S S S S S S S S S S S	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00 14.65 19.20 72.73 102.15	Qty 700 27.1555556 200 945 418.89 0 1 1 0 10 0 25.9222222	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00 - 192.00 - 2,647.96
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 24 in PVC Permeable Pavement Materials & Labor	Unit SY SY CY LF SY CY AC EA LF LF LF SY	Uni \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00 14.65 19.20 72.73 102.15	Qty 700 27.1555556 200 945 418.89 0 1 1 0 10 25.9222222	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00 - 192.00 - 2,647.96 66,233.12
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Seeding and Fertilization ADA Parking Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 24 in PVC Permeable Pavement Materials & Labor Contingency	Unit SY SY CY LF SY CY AC EA LF LF LF SY	Uni \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	it Cost 60.72 50.28 25.11 40.01 8.90 6.95 3,439.47 200.00 14.65 19.20 72.73 102.15	Qty 700 27.1555556 945 418.89 0 1 1 0 25.9222222 10%	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	42,504.00 1,365.38 - 8,002.00 8,410.50 2,911.29 - 200.00 - 192.00 - 2,647.96 66,233.12 6,623.31

Lot	Design	Alte	ernative			
Bluejay	Biocell	HM	A			
Item	Unit	Uni	it Cost	Qty	Cost	
Commerical HMA 5 in	Ton	\$	186.51	889.11	\$	165,827.91
Sidewalk 4in	SY	\$	50.28	2455.55556	\$	123,465.33
Topsoil	CY	\$	25.11	0	\$	-
6 in Curb & Gutter	LF	\$	40.01	2289	\$	91,582.89
Removal of Pavement	SY	\$	8.90	10994	\$	97,846.60
Excavation Class 10	CY	\$	6.95	780.15	\$	5,422.04
Seeding and Fertilization	AC	\$ 3	3,439.47	0	\$	-
ADA Parking Sign	EA	\$	200.00	6	\$	1,200.00
Perforated Subdrain 6 in	LF	\$	14.65	0	\$	-
Storm Sewer 8 in PVC	LF	\$	19.20	90	\$	1,728.00
Storm Sewer 24 in PVC	LF	\$	72.73	0	\$	-
Biocell	SY	\$	180.00	204.666667	\$	36,840.00
Materials & Labor					\$	523,912.77
Contingency				10%	\$	52,391.28
Total					\$	576,500.00
Lot	Design	Alte	ernative			
Bluejay	Biocell	PCC				
Item	Unit	Uni	it Cost	Qty	Cost	
Driveway PC Concrete 6 in	SY	\$	60.72	3384	\$	205,476.48
Sidewalk 4in	SY	\$	50.28	2455.55556	\$	123,465.33
Topsoil	CY	\$	25.11	0	\$	-
6 in Curb & Gutter	LF	\$	40.01	2289	\$	91,582.89
Removal of Pavement	SY	\$	8.90	10994	\$	97,846.60
Excavation Class 10	CY	\$	6.95	780.15	\$	5,422.04
Seeding and Fertilization	AC	\$:	3,439.47	0	\$	-
ADA Parking Sign	EA	\$	200.00	6	\$	1,200.00
Perforated Subdrain 6 in	LF	\$	14.65	0	\$	-
Storm Sewer 8 in PVC	LF	\$	19.20	90	\$	1,728.00
Storm Sewer 24 in PVC	LF	\$	72.73	0	\$	-
Biocell	SY	\$	180.00	204.666667	\$	36,840.00
Materials & Labor					\$	563,561.35
materials a cabor						
Contingency				10%	\$	56,356.13
Contingency Total				10%	\$ \$	56,356.13 620,000.00

Lot	Design	Alternative		
Oriole	Biocell	НМА		
Item	Unit	Unit Cost	Qty	Cost
Commerical HMA 6in	Ton	\$ 186.51	1189.89	\$221,926,38
Topsoil	CY	\$ 25.11	0	S -
6 in Curb & Gutter	LF	\$ 40.01	1207.4	\$ 48,308.07
Removal of Pavement	SY	\$ 8.90	8243	\$ 73,362,70
Excavation Class 10	CY	\$ 6.95	1163.45	\$ 8,085,96
Granular Subbase	SY	\$ 8.06	3525.6	\$ 28 416 34
Green Fencing	LF	\$ 40.00	1476	\$ 59,040,00
Light Pole	FA	\$ 1 200 00	18	\$ 21,600,00
Light Fixture	FΔ	\$ 400.00	18	\$ 7,200,00
Intake	FΔ	\$ 3 388 61	10	\$ -
Seeding and Fertilization	AC	\$ 3,439.47	0.1447	\$ 497.69
Permeable Pavers	SY	\$ 102.15	1401	\$143,112,15
Biocell	SY	\$ 180.00	700 3	\$126 054 00
ADA Parking Sign	FA	\$ 200.00	4	\$ 800.00
Lot Name Sign	FΔ	\$ 1,000,00	1	\$ 1,000,00
Storm Sewer 12 in PVC	LA	\$ 59.10	244.1	\$ 14 426 31
Materials & Labor		\$ 55.10	244.1	\$753,829,61
Contingency			10%	\$ 75 382 96
Total			1070	\$ 73,382.50
Total	1			\$625,000.00
Lot	Design	Alternative		
Oriole	Biocell	PCC		
Item	1	Unit Cost	Otv	Cost
	Unit	Oniccosc	QLY	0030
Driveway PC Concrete 6 in	Unit SY	\$ 60.72	3525.6	\$214,074.43
Driveway PC Concrete 6 in Topsoil	Unit SY CY	\$ 60.72 \$ 25.11	3525.6 0	\$214,074.43 \$-
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter	Unit SY CY LF	\$ 60.72 \$ 25.11 \$ 40.01	3525.6 0 1207.4	\$214,074.43 \$- \$48,308.07
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement	Unit SY CY LF SY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90	3525.6 0 1207.4 8243	\$214,074.43 \$- \$48,308.07 \$73,362.70
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	Unit SY CY LF SY CY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95	3525.6 0 1207.4 8243 1163.45	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	Unit SY CY LF SY CY SY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06	3525.6 0 1207.4 8243 1163.45 3525.6	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	Unit SY CY LF SY CY SY LF	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00	3525.6 0 1207.4 8243 1163.45 3525.6 1476	\$214,074.43 \$- \$48,308.07 \$73,362.70 \$8,085.96 \$28,416.34 \$59,040.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	Unit SY CY LF SY CY SY LF EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	Unit SY CY LF SY CY SY LF EA EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake	Unit SY CY LF SY CY SY LF EA EA EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 18 0	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ -
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	Unit SY CY LF SY CY SY LF EA EA EA EA AC	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 18 0 0.1447	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ - \$ 497.69
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers	Unit SY CY LF SY CY SY LF EA EA EA EA SY	S 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 0 0.1447 1401	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ - \$ 497.69 \$143,112.15
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell	Unit SY CY LF SY CY SY LF EA EA EA AC SY SY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 0 0.1447 1401 700.3	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ - \$ 497.69 \$143,112.15 \$126,054.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign	Unit SY CY LF SY CY SY LF EA EA EA EA SY SY EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 0 0.1447 1401 700.3 4	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 73,362.70 \$ 73,362.70 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 497.69 \$143,112.15 \$126,054.00 \$ 800.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign	Unit SY CY LF SY CY SY LF EA EA EA SY SY EA EA EA EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 0 0.1447 1401 700.3 4 1	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 497.69 \$143,112.15 \$126,054.00 \$ 800.00 \$ 1,000.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC	Unit SY CY LF SY CY SY LF EA EA EA AC SY SY EA EA LF LF LF LF LF LF LF LF LF LF	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00 \$ 59.10	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 0 0.1447 1401 700.3 4 1 244.1	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 497.69 \$143,112.15 \$126,054.00 \$ 800.00 \$ 1,000.00 \$ 1,000.00
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC Materials & Labor	Unit SY CY LF SY CY SY LF EA EA EA AC SY SY EA EA LF	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00 \$ 59.10	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 1476 18 0 0.1447 1401 700.3 4 1 244.1	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 143,112.15 \$126,054.00 \$ 800.00 \$ 1,000.00 \$ 14,426.31 \$745,977.66
Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC Materials & Labor Contingency	Unit SY CY LF SY CY SY LF EA EA EA AC SY SY EA EA LF	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 1,000.00 \$ 1,000.00 \$ 59.10	3525.6 0 1207.4 8243 1163.45 3525.6 1476 18 18 0 0.1447 1401 700.3 4 1 244.1	\$214,074.43 \$ - \$ 48,308.07 \$ 73,362.70 \$ 8,085.96 \$ 28,416.34 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 497.69 \$143,112.15 \$126,054.00 \$ 1,000.00 \$ 14,426.31 \$745,977.66 \$ 74.597.77

Lot	Design	Alternative		
Oriole	Permeable	HMA		
Item	Unit	Unit Cost	Qty	Cost
Commerical HMA 6in	Ton	\$ 186.51	760.489	\$141,838.76
Topsoil	CY	\$ 25.11	116.8	\$ 2,932.85
6 in Curb & Gutter	LF	\$ 40.01	2095.4	\$ 83,836.95
Removal of Pavement	SY	\$ 8.90	8243	\$ 73,362.70
Excavation Class 10	CY	\$ 6.95	743.589	\$ 5,167.94
Granular Subbase	SY	\$ 8.06	2253.3	\$ 18,161.60
Green Fencing	LF	\$ 40.00	1476	\$ 59,040.00
Light Pole	EA	\$ 1,200.00	18	\$ 21,600.00
Light Fixture	EA	\$ 400.00	18	\$ 7,200.00
Intake	EA	\$ 3,388.61	0	s -
Seeding and Fertilization	AC	\$ 3,439.47	0.1448	\$ 498.04
Permeable Pavers	SY	\$ 102.15	2632.1	\$268,869.02
ADA Parking Sign	EA	\$ 200.00	4	\$ 800.00
Lot Name Sign	EA	\$ 1,000.00	1	\$ 1,000.00
Perforated Subdrain 6 in	LF	\$ 14.65	1085.3	\$ 15,899.65
	LF	\$ 19.20	430.2	\$ 8,259.84
Storm Sewer 8 in PVC				
Storm Sewer 8 in PVC Storm Sewer 12 in PVC	LF	\$ 59.10	22	\$ 1,300.20
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor	LF	\$ 59.10	22	\$ 1,300.20 \$709.767.54
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency	LF	\$ 59.10	22	\$ 1,300.20 \$709,767.54 \$ 70.976.75
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total	LF	\$ 59.10	22	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780.500.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total	LF	\$ 59.10	10%	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total	LF Design	\$ 59.10	10%	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole	LF Design Permeable	\$ 59.10 Alternative PCC	22 10%	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole	LF Design Permeable	\$ 59.10 Alternative PCC	22	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item	Design Permeable	\$ 59.10 Alternative PCC Unit Cost	22 10%	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in	Design Permeable Unit SY	\$ 59.10 Alternative PCC Unit Cost \$ 60.72	22 10% Qty 2253.3	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil Concrete 8 contexes	LF Design Permeable Unit SY CY	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11	22 10% Qty 2253.3 116.8	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Demond of Devenuent	Design Permeable Unit SY CY LF	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01	22 10% Qty 2253.3 116.8 2095.4	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73 260 70
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement	LF Design Permeable Unit SY CY LF SY CY	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90	22 10% Qty 2253.3 116.8 2095.4 8243	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	Design Permeable Unit SY CY LF SY CY	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 0.05	22 10% Qty 2253.3 116.8 2095.4 8243 743.589	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 19 161.62
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	LF Design Permeable Unit SY CY LF SY CY SY	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 0.040.22
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	LF Design Permeable Unit SY CY LF SY CY SY LF SY	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1.200.00	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3 1476	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 29,040.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 18	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Conding and Society of Society of Society	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 2 2.57	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 18 18 0 0	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ -
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	LF Design Permeable Unit SY CY LF SY CY SY CY SY LF EA EA EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 6.95	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 18 0 0.1448	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ - \$ 498.04 \$ 298.04
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 202.02	22 10% 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 1476 18 18 0 0.1448 2632.1	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,000 \$ 7,000 \$ 7,000
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 148 0 0.1448 2632.1 4	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,000 \$ 7,000
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 148 0 0.1448 2632.1 4 1	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 498.04 \$268,869.02 \$ 800.00 \$ 1,000.00
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Perforated Subdrain 6 in	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 14.65 \$ 14.65	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 0 0.1448 2632.1 4 1 1085.3 1085.3	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 498.04 \$268,869.02 \$ 800.00 \$ 1,000.00 \$ 1,
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA EA	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 1,000.00 \$ 14.65 \$ 19.20	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 0 0.1448 2632.1 4 1085.3 430.2	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 1,000.00 \$ 1,000.00 \$ 15,899.65 \$ 8,259.84 \$ 2,59.84 \$ 2,59.84
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 12 in PVC	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA EA LF EA LF LF	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 1,200.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 1,000.00	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 1476 18 0 0.1448 2632.1 4 1085.3 430.2 22	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 15,890.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 10,000 \$ 15,899.65 \$ 8,259.84 \$ 1,300.20
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA EA EA LF LF LF	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 1,200.00 \$ 1,200.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 14.65 \$ 19.20 \$ 59.10	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 1476 18 0 0.1448 2632.1 4 1085.3 430.2 22	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 1,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 1,600.00 \$ 1,600.00 \$ 1,600.00 \$ 1,5,899.65 \$ 8,259.84 \$ 1,300.20 \$ 704,749.15 \$ 1,300.20 \$ 704,749.15 \$ 1,300.20 \$ 704,749.15 \$ 1,200.15 \$ 1,200.20 \$ 1,200.
Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency Total Lot Oriole Item Driveway PC Concrete 6 in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency	LF Design Permeable Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA LF LF LF LF	\$ 59.10 Alternative PCC Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 14.65 \$ 19.20 \$ 59.10	22 10% Qty 2253.3 116.8 2095.4 8243 743.589 2253.3 1476 18 1476 18 00 0.1448 2632.1 4 1085.3 430.2 22 10%	\$ 1,300.20 \$709,767.54 \$ 70,976.75 \$780,500.00 Cost \$136,820.38 \$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 5,167.94 \$ 18,161.60 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 7,200.00 \$ 1,000.00 \$ 1,000.00 \$ 1,5,899.65 \$ 8,259.84 \$ 1,300.20 \$704,749.15 \$ 70,474.92

Lot	Design	Alternat	tive		
Oriole	Traditional	HMA			
-				-	-
Item	Unit	Unit Cos	st	Qty	Cost
Commerical HMA 6in	Ton	\$ 186	.51	1625.94	\$303,254.07
Topsoil	CY	\$ 25	.11	116.8	\$ 2,932.85
6 in Curb & Gutter	LF	\$ 40	.01	2095.4	\$ 83,836.95
Removal of Pavement	SY	\$ 8	.90	8243	\$ 73,362.70
Excavation Class 10	CY	\$ 6	.95	1589.81	\$ 11,049.17
Granular Subbase	SY	\$ 8	.06	1625.94	\$ 13,105.08
Green Fencing	LF	\$ 40	.00	1476	\$ 59,040.00
Light Pole	EA	\$ 1,200	.00	18	\$ 21,600.00
Light Fixture	EA	\$ 400	.00	18	\$ 7,200.00
Intake	EA	\$ 3,388	.61	6	\$ 20,331.66
Seeding and Fertilization	AC	\$ 3,439	.47	0.1448	\$ 498.04
ADA Parking Sign	EA	\$ 200	.00	4	\$ 800.00
Lot Name Sign	EA	\$ 1,000	.00	1	\$ 1,000.00
Storm Sewer 8 in PVC	LF	\$ 19	.20	561.4	\$ 10,778.88
Storm Sewer 12 in PVC	LF	\$ 59	.10	99	\$ 5,850.90
Materials & Labor					\$614,640.29
Contingency				10%	\$ 61,464.03
Total					\$676,000.00
Lot	Design	Alternat	tive		
Oriole	Traditional	PCC			
Item	Unit	Unit Cos	st	Qty	Cost
Driveway PC Constate 6 in	SY	\$ 60	.72	4817.6	\$292,524.67
Driveway PC Concrete 6 m			11	110.0	¢ 0.000.05
Topsoil	CY	\$ 25		110.8	\$ 2,932.85
Topsoil 6 in Curb & Gutter	CY LF	\$ 25 \$ 40	.01	2095.4	\$ 2,932.85 \$ 83,836.95
Topsoil 6 in Curb & Gutter Removal of Pavement	CY LF SY	\$ 25 \$ 40 \$ 8	.01	2095.4 8243	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	CY LF SY CY	\$ 25 \$ 40 \$ 8 \$ 6	.01 .90 .95	2095.4 8243 1589.81	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	CY LF SY CY SY	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8	.01 .90 .95 .06	2095.4 8243 1589.81 4817.6	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	CY LF SY CY SY LF	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 8 \$ 8 \$ 40	.01 .90 .95 .06 .00	2095.4 8243 1589.81 4817.6 1476	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	CY LF SY CY SY LF EA	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200	0.01 0.90 0.95 0.06 0.00 0.00	2095.4 8243 1589.81 4817.6 1476 18	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	CY LF SY CY SY LF EA EA	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400	0.01 0.01 0.95 0.06 0.00 0.00 0.00	116.8 2095.4 8243 1589.81 4817.6 1476 18 18	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake	CY LF SY CY SY LF EA EA EA	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388	0.01 0.90 0.95 0.06 0.00 0.00 0.00 0.00	116.8 2095.4 8243 1589.81 4817.6 1476 18 18 6	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 7,200.00 \$ 20,331.66
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	CY LF SY CY SY LF EA EA EA AC	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 400 \$ 3,388 \$ 3.439	0.01 0.90 0.95 0.06 0.00 0.00 0.00 0.00 0.00 0.00 0.0	116.8 2095.4 8243 1589.81 4817.6 1476 18 18 18 6 0.1448	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 7,200.00 \$ 20,331.66 \$ 498.04
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign	CY LF SY CY SY LF EA EA EA AC EA	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388 \$ 3,439 \$ 200	0.01 0.90 0.95 0.06 0.00 0.00 0.00 0.00 0.00 0.47 0.00	116.8 2095.4 8243 1589.81 4817.6 1476 1476 18 18 6 0.1448 4	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 7,200.00 \$ 20,331.66 \$ 498.04 \$ 800.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign	CY LF SY CY SY LF EA EA EA AC EA EA EA	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388 \$ 3,439 \$ 200 \$ 1.000	0.01 0.01 0.95 0.06 0.00 0.00 0.00 0.00 0.00 0.47 0.00 0.00 0.00	116.8 2095.4 8243 1589.81 4817.6 1476 1476 18 18 6 0.1448 4 1	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 21,600.00 \$ 20,331.66 \$ 498.04 \$ 800.00 \$ 1,000.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC	CY LF SY CY SY LF EA EA EA EA EA EA LF EA	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388 \$ 3,439 \$ 200 \$ 1,000 \$ 1,000	0.01 0.90 0.95 0.06 0.00 0.00 0.00 0.00 0.47 0.00 0.00 0.20	116.8 2095.4 8243 1589.81 4817.6 1476 18 18 6 0.1448 4 1 561.4	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 20,331.66 \$ 498.04 \$ 800.00 \$ 1,000.00 \$ 10,778.88
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC	CY LF SY CY SY LF EA EA EA EA EA EA LF LF LF	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388 \$ 3,439 \$ 200 \$ 1,000 \$ 19 \$ 59	0.01 0.01 0.95 0.06 0.00	116.8 2095.4 8243 1589.81 4817.6 1476 18 18 6 0.1448 4 1 561.4 99	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 20,331.66 \$ 498.04 \$ 800.00 \$ 1,000.00 \$ 10,778.88 \$ 5,850.90
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor	CY LF SY CY SY LF EA EA EA EA EA LF LF LF LF	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388 \$ 3,439 \$ 200 \$ 1,000 \$ 1,900 \$ 19 \$ 59	0.01 0.01 0.90 0.95 0.06 0.00	116.8 2095.4 8243 1589.81 4817.6 1476 18 18 6 0.1448 4 1 561.4 99	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 20,331.66 \$ 498.04 \$ 800.00 \$ 1,000.00 \$ 1,000.00 \$ 10,778.88 \$ 5,850.90 \$ 5,850.90
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency	CY LF SY CY SY LF EA EA EA EA EA LF LF LF LF	\$ 25 \$ 40 \$ 8 \$ 6 \$ 8 \$ 40 \$ 1,200 \$ 400 \$ 3,388 \$ 3,439 \$ 200 \$ 1,000 \$ 19 \$ 59	0.01 9.90 9.95 0.06 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.20 0.10	116.8 2095.4 8243 1589.81 4817.6 1476 18 18 6 0.1448 4 1 561.4 99	\$ 2,932.85 \$ 83,836.95 \$ 73,362.70 \$ 11,049.17 \$ 38,829.86 \$ 59,040.00 \$ 21,600.00 \$ 21,600.00 \$ 21,600.00 \$ 20,331.66 \$ 498.04 \$ 800.00 \$ 1,000.00 \$ 1,000.00 \$ 1,000.00 \$ 5,850.90 \$

Lot	Design	Alternative	1	
Chickadee	Biocell	HMA		
Item	Unit	Unit Cost	Qty	Cost
Commerical HMA 6in	Ton	\$ 186.51	413.26875	\$ 77,078.75
Topsoil	CY	\$ 25.11	66.5	\$ 1,669.82
6 in Curb & Gutter	LF	\$ 40.01	550.6	\$ 22,029.51
Removal of Pavement	SY	\$ 8.90	1929	\$ 17,168.10
Excavation Class 10	CY	\$ 6.95	408.17	\$ 2,836.78
Granular Subbase	SY	\$ 8.06	1224.5	\$ 9,869.47
Green Fencing	LF	\$ 40.00	495.7	\$ 19,828.00
Light Pole	EA	\$ 1,200.00	8	\$ 9,600.00
Light Fixture	EA	\$ 400.00	8	\$ 3,200.00
Intake	EA	\$ 3,388.61	0	\$ -
Seeding and Fertilization	AC	\$ 3,439.47	0.0825	\$ 283.76
Permeable Pavers	SY	\$ 102.15	0	\$ -
Biocell	SY	\$ 180.00	399.1	\$ 71,838.00
ADA Parking Sign	EA	\$ 200.00	2	\$ 400.00
Lot Name Sign	EA	\$ 1,000.00	1	\$ 1,000.00
Storm Sewer 12 in PVC	LF	\$ 59.10	53.3	\$ 3,150.03
Materials & Labor				\$236,802.18
Contingency	1		10%	\$ 23,680.22
Total	1			\$260,500.00
l at	Desire	Alterative		
LOL	Design	Alternative		
Unickadee	BIOCEII	ru		
ltem	Unit	Unit Cost	Otv	Cost
Drivewov PC Concrete 6 in	ev		4004 5	COSL
briveway reconcrete 6 In	1.11		1110 -	
Topsoil	CV.	\$ 00.72 \$ 25.11	1224.5	\$ 74,351.64
Topsoil 5 in Curb & Cuttor	CY	\$ 25.11	66.5	\$ 74,351.64 \$ 1,669.82 \$ 22,020.51
Topsoil 6 in Curb & Gutter	CY LF	\$ 60.72 \$ 25.11 \$ 40.01	66.5 550.6	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,158.10
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	CY LF SY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90	1224.5 66.5 550.6 1929	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,825.79
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	CY LF SY CY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 6.95	1224.5 66.5 550.6 1929 408.17	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,859.47
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	CY LF SY CY SY	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06	1224.5 66.5 550.6 1929 408.17 1224.5	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 10,828.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	CY LF SY CY SY LF	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 40.00 \$ 40.00	1224.5 66.5 550.6 1929 408.17 1224.5 495.7	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	CY LF SY CY SY LF EA EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	CY LF SY CY SY LF EA EA	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Eastilization	CY LF SY CY SY LF EA EA EA	\$ 00.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,420.47	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 8 0	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ - \$ - \$ 283.75
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	CY LF SY CY SY LF EA EA EA EA	\$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 1,200.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 8 0 0.0825	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers	CY LF SY CY SY LF EA EA EA EA SY SY	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 8 0 0.0825 0 0	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 283.76
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell	CY LF SY CY SY LF EA EA EA EA SY SY EA	S 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 8 0 0.0825 0 0.0825 0 399.1	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 283.76 \$ - \$ 71,838.00 \$ 71,838.00 \$ 0 0 00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign	CY LF SY CY SY LF EA EA EA SY SY EA EA	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 0 0.0825 0 0.0825 0 399.1	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 71,838.00 \$ 71,838.00 \$ 400.00 \$ 1000.00
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign	CY LF SY CY SY LF EA EA EA AC SY SY EA EA	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 8 0 0.0825 0 0.0825 0 399.1 2 2	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 71,838.00 \$ 400.00 \$ 1,000.00 \$ 2,000
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC	CY LF SY CY SY LF EA EA EA AC SY SY EA EA LF	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00 \$ 59.10	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 0 0.0825 0 0.0825 0 399.1 2 2 1 53.3	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 71,838.00 \$ 71,838.00 \$ 400.00 \$ 1,000.00 \$ 3,150.03
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC Materials & Labor	CY LF SY CY SY LF EA EA EA AC SY SY EA EA LF	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00 \$ 59.10	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 0 0.0825 0 0 399.1 2 2 1 53.3	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 71,838.00 \$ 400.00 \$ 1,000.00 \$ 3,150.03 \$ 237,225.10 \$ 283.72
Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC Materials & Labor Contingency Total	CY LF SY CY SY LF EA EA EA AC SY SY EA EA LF	5 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 180.00 \$ 200.00 \$ 1,000.00 \$ 59.10	1224.5 66.5 550.6 1929 408.17 1224.5 495.7 8 8 0 0.0825 0 0.0825 0 0 399.1 2 2 1 1 53.3	\$ 74,351.64 \$ 1,669.82 \$ 22,029.51 \$ 17,168.10 \$ 2,836.78 \$ 9,869.47 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 283.76 \$ - \$ 71,838.00 \$ 400.00 \$ 1,000.00 \$ 3,150.03 \$237,225.10 \$ 23,722.51

Design	Alternative	1	
Permeable	нма		
. ennedore			
Unit	Unit Cost	Qtv	Cost
Ton	\$ 186.51	249.71625	\$ 46,574,58
CY	\$ 25.11	62.4	\$ 1,566.86
LF	\$ 40.01	777.1	\$ 31,091.77
SY	\$ 8.90	1929	\$ 17,168.10
CY	\$ 6.95	246.63	\$ 1,714.08
SY	\$ 8.06	249.71625	\$ 2,012.71
LF	\$ 40.00	495.7	\$ 19,828.00
EA	\$ 1,200.00	8	\$ 9,600.00
EA	\$ 400.00	8	\$ 3,200.00
EA	\$ 3,388.61	0	\$ -
AC	\$ 3,439.47	0.0774	\$ 266.21
SY	\$ 102.15	720.7	\$ 73,619.51
EA	\$ 200.00	2	\$ 400.00
EA	\$ 1,000.00	1	\$ 1,000.00
LF	\$ 14.65	474.6	\$ 6,952.89
LF	\$ 19.20	299.6	\$ 5,752.32
LF	\$ 59.10	24.1	\$ 1,424.31
			\$222,171.34
		10%	\$ 22,217.13
			\$244,500.00
Design	Alternative		
Permeable	Anternative		
remeable	ree		
Unit	Unit Cost	Qty	Cost
Unit SY	Unit Cost \$ 60.72	Qty 739.9	Cost \$ 44,926.73
Unit SY CY	Unit Cost \$ 60.72 \$ 25.11	Qty 739.9 62.4	Cost \$ 44,926.73 \$ 1,566.86
Unit SY CY LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01	Qty 739.9 62.4 777.1	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77
Unit SY CY LF SY	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90	Qty 739.9 62.4 777.1 1929	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10
Unit SY CY LF SY CY	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95	Qty 739.9 62.4 777.1 1929 246.63	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08
Unit SY CY LF SY CY SY	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06	Qty 739.9 62.4 777.1 1929 246.63 739.9	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59
Unit SY CY LF SY CY SY LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00
Unit SY CY LF SY CY SY LF EA	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00
Unit SY CY LF SY CY SY LF EA EA	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00
Unit SY CY LF SY CY SY LF EA EA EA	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 8 0	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ -
Unit SY CY LF SY CY SY LF EA EA EA EA	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 8 0 0 0.0774	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ - \$ 266.21
Unit SY CY LF SY CY SY LF EA EA EA EA SY	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 8 0 0.0774 720.7	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51
Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 0 0.0774 720.7 2	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00
Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 0 0.0774 720.7 2 1	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 9,600.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00 \$ 1,000.00
Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 1,000.00 \$ 14.65	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 8 0 0 0.0774 720.7 2 1 1 474.6	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00 \$ 1,000.00 \$ 6,952.89
Unit SY CY LF SY CY SY LF EA EA EA EA AC SY EA EA LF LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 1,000.00 \$ 14.65 \$ 19.20	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 8 0 0 0.0774 720.7 2 1 1 474.6 299.6	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00 \$ 1,000.00 \$ 1,000.00 \$ 6,952.89 \$ 5,752.32
Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA LF LF LF LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 1,000.00 \$ 14.65 \$ 19.20 \$ 59.10	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 0 0 0.0774 720.7 2 1 1 474.6 299.6 24.1	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00 \$ 1,000.00 \$ 6,952.89 \$ 5,752.32 \$ 1,424.31
Unit SY CY LF SY CY SY LF EA EA EA EA EA EA LF LF LF LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 14.65 \$ 19.20 \$ 59.10	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 0 0.0774 720.7 2 1 1 474.6 299.6 24.1	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00 \$ 1,000.00 \$ 6,952.89 \$ 5,752.32 \$ 1,424.31 \$224,474.38
Unit SY CY LF SY CY SY LF EA EA EA EA EA EA EA LF LF LF LF	Unit Cost \$ 60.72 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$	Qty 739.9 62.4 777.1 1929 246.63 739.9 495.7 8 8 0 0.0774 720.7 2 1 1 474.6 299.6 24.1	Cost \$ 44,926.73 \$ 1,566.86 \$ 31,091.77 \$ 17,168.10 \$ 1,714.08 \$ 5,963.59 \$ 19,828.00 \$ 9,600.00 \$ 3,200.00 \$ 3,200.00 \$ 3,200.00 \$ - \$ 266.21 \$ 73,619.51 \$ 400.00 \$ 1,000.00 \$ 6,952.89 \$ 5,752.32 \$ 1,424.31 \$224,474.38 \$ 22,447.44
	Design Permeable Unit Ton CY LF SY CY SY LF EA EA EA EA EA EA EA LF LF LF LF LF LF Permeable	Design Alternative Permeable HMA Unit Unit Cost Ton \$ 186.51 CY \$ 25.11 LF \$ 40.01 SY \$ 8.90 CY \$ 6.95 SY \$ 8.06 LF \$ 40.00 EA \$ 1,200.00 EA \$ 1,000.00 LF \$ 102.15 EA \$ 200.00 EA \$ 1,000.00 LF \$ 14.65 LF \$ 19.20 LF \$ 59.10 Design Alternative Permeable PCC	Design Alternative Permeable HMA Unit Unit Cost Qty Ton \$ 186.51 249.71625 CY \$ 25.11 62.4 LF \$ 40.01 777.1 SY \$ 8.90 1929 CY \$ 6.95 246.63 SY \$ 8.06 249.71625 LF \$ 40.00 495.7 EA \$ 1,200.00 8 EA \$ 400.00 8 EA \$ 1,200.00 8 EA \$ 1,200.00 8 EA \$ 1,200.00 18 EA \$ 1,200.00 18 EA \$ 1,200.00 18 EA \$ 1,200.00 12 EA \$ 1,200.00 12 EA \$ 1,200.00 12 EA \$ 1,000.00 1 LF \$ 1,000.00 1 LF \$ 19.20 299.6 LF \$ 59.10 24.1

Lot	Design	Alt	ernati	ve		+	
Chickadee	Traditional	HN	1A			-	
						+	
Item	Unit	Un	it Cost		Qty	Co	ost
Commerical HMA 6in	Ton	\$	186.5	51	480.29625	5	89,580.05
Topsoil	СҮ	\$	25.1	11	67.8	\$ \$	1,702.46
6 in Curb & Gutter	LF	\$	40.0	01	777.1	\$	31,091.77
Removal of Pavement	SY	\$	8.9	90	1929	\$	17,168.10
Excavation Class 10	CY	\$	6.9	95	474.37	\$	3,296.87
Granular Subbase	SY	\$	8.0)6	1423.1	\$	11,470.19
Green Fencing	LF	\$	40.0	00	495.7	\$	19,828.00
Light Pole	EA	\$	1,200.0	00	8	\$	9,600.00
Light Fixture	EA	\$	400.0	00	8	\$	3,200.00
Intake	EA	\$	3,388.6	51	2	2 \$	6,777.22
Seeding and Fertilization	AC	\$	3,439.4	47	0.084	\$	288.92
ADA Parking Sign	EA	\$	200.0	00	2	\$	400.00
Lot Name Sign	EA	\$	1,000.0	00	1	\$	1,000.00
Storm Sewer 8 in PVC	LF	\$	19.2	20	62.3	\$	1,196.16
Storm Sewer 12 in PVC	LF	\$	59.1	10	32.1	\$	1,897.11
Materials & Labor						\$	198,496.85
Contingency					10%	5 \$	19,849.68
Total						\$	218,500.00
lot	Design		ernati	ve		+	
Chickadee	Traditional	PC	0			+	
				_		+	
Item	Unit	Un	it Cost		Qty	Co	ost
Driveway PC Concrete 6 in	SY	c	60 3	70	1423 1		86 410 63
Tonsoil				12	1720.1	. 5	00,410.00
1002011	СҮ	S	25.1	11	67.8	. \$ \$	1,702.46
6 in Curb & Gutter	CY LF	\$	25.1	11 01	67.8	5 5 5 5	1,702.46
6 in Curb & Gutter Removal of Pavement	CY LF SY	\$ \$ \$	25.1 40.0 8.9	/2 11 01	67.8 777.1 1929	5 5 5 5 5 5 5	1,702.46 31,091.77 17,168.10
6 in Curb & Gutter Removal of Pavement Excavation Class 10	CY LF SY CY	\$ \$ \$ \$	25.1 40.0 8.9 6.9	/2 11 01 90	67.8 777.1 1929 474.37	s s s s s s s s s s s s s s s s s s s	1,702.46 31,091.77 17,168.10 3,296.87
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	CY LF SY CY SY	\$ \$ \$ \$ \$	25.1 40.0 8.9 6.9 8.0	2 11 01 90 95 06	67.8 777.1 1929 474.37 1423.1	5 5 5 5 7 5 5 5 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	CY LF SY CY SY LF	\$ \$ \$ \$ \$ \$	25.1 40.0 8.9 6.9 8.0 40.0	72 11 01 90 95 06 00	67.8 777.1 1929 474.37 1423.1 495.7	5 5 5 5 7 5 7 5 7 5 7 5 7 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	CY LF SY CY SY LF EA	\$ \$ \$ \$ \$ \$ \$ \$ \$	25.1 40.0 8.9 6.9 8.0 40.0 1,200.0	2 11 01 90 95 06 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8		1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	CY LF SY CY SY LF EA EA	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	25.1 40.0 8.9 6.9 8.0 40.0 1,200.0 400.0	2 11 01 30 35 06 00 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8		1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake	CY LF SY CY SY LF EA EA EA	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.: 40.(8.9 6.9 8.(40.(1,200.(3,388.(72 11 01 90 95 06 00 00 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8 8	1 S 3 S 4 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	CY LF SY CY SY LF EA EA EA EA	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.: 40.(8.9 6.9 40.(1,200.(3,388.(3,439.4	72 11 01 90 95 06 00 00 00 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	1 S 3 S 4 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign	CY LF SY CY SY LF EA EA EA EA EA EA	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.1 40.0 8.9 6.9 8.0 1,200.0 3,388.0 3,439.4 200.0	72 11 01 00 00 00 00 00 00 00 00 00 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	1 S 3 S 4 S 5 S 6 S 7 S 8 S 9 S 9 S 9 S 9 S 9 S 9 S 10 S 11 S 12 S 12 S	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92 400.00
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign	CY LF SY CY SY LF EA EA EA EA EA EA EA	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.1 40.0 8.9 6.9 8.0 1,200.0 400.0 3,388.0 3,439.4 200.0 1,000.0	72 11 01 90 95 06 00 00 00 00 51 47 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8 8 8 8 8 0.084	1 S 3 S 4 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92 400.00 1,000.00
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC	CY LF SY CY SY LF EA EA EA EA EA EA EA LF	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.: 40.0 8.9 6.9 8.0 40.0 1,200.0 3,388.0 3,439.4 200.0 1,000.0 19.2	72 11 01 90 95 06 00 00 00 00 00 00 00 00 00 00 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8 8 0.084 2 0.084 2 1 1 62.3	1 5 3 5 4 5 5 5 6 5 7 5 8 5 9 5 1 5 1 5 2 5 2 5 1 5 2 5 3 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92 400.00 1,000.00 1,196.16
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC	CY LF SY CY SY LF EA EA EA EA EA EA LF LF	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.1 40.0 8.9 6.9 8.0 40.0 1,200.0 3,388.0 3,439.4 200.0 1,000.0 19.7 59.1	72 11 01 00 05 00 00 00 00 00 00 00 00 00 00 00	67.8 777.1 1929 474.37 1423.1 495.7 8 0.084 0.084 1 62.3 32.1	1 55 2 5 3 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92 400.00 1,000.00 1,196.16 1,897.11
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor	CY LF SY CY SY LF EA EA EA EA EA EA LF LF	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.1 40.0 8.9 6.9 8.0 40.0 1,200.0 3,388.0 3,439.4 200.0 1,000.0 19.2 59.1	72 11 20 20 20 20 20 20 20 20	67.8 777.1 1929 474.37 1423.1 495.7 8 8 0.084 2 1 62.3 32.1	1 55 2 5 3 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92 400.00 1,000.00 1,196.16 1,897.11 195,327.42
6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency	CY LF SY CY SY LF EA EA EA EA EA EA LF LF LF	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	25.1 40.0 8.9 6.9 8.0 400.0 1,200.0 3,388.0 3,439.4 200.0 1,000.0 19.1 59.1	72 11 20 20 20 20 20 10	67.8 777.1 1929 474.37 1423.1 495.7 8 8 0.084 2 0.084 2 0.084 2 1 62.3 32.1 10%	1 55 2 5 3 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1,702.46 31,091.77 17,168.10 3,296.87 11,470.19 19,828.00 9,600.00 3,200.00 6,777.22 288.92 400.00 1,000.00 1,196.16 1,897.11 195,327.42 19,532.742

Lot	Design	Alt	ernative			
Goldfinch	Biocell	HM	14			
	510000					
Item	Unit	Un	it Cost	Qtv	Cost	
Commerical HMA 6in	Ton	s	186.51	502.6	s	93,739,93
Sidewalk 4in	SY	Ś	50.28	34.67	ŝ	1.743.21
Topsoil	CY	Ś	25.11	16.76	ŝ	420.84
6 in Curb & Gutter	LF	Ś	40.01	558.18	ŝ	22.332.78
Removal of Pavement	SY	Ś	8.90	2245	ŝ	19,980,50
Excavation Class 10	CY	Ś	6.95	496.5	ŝ	3,450,68
Granular Subbase	SY	Ś	8.06	1489.51	ŝ	12.005.45
Green Fencing	LF	Ś	40.00	194.5	Ś	7,780.00
Light Pole	EA	Ś	1.200.00	2	Ś	2,400.00
Light Fixture	EA	Ś	400.00	2	Ś	800.00
Intake	EA	\$	3,388.61	0	S	-
Seeding and Fertilization	AC	\$	3,439.47	0.0477	\$	164.06
Permeable Pavers	SY	\$	102.15	338.25	\$	34,552.24
Biocell	SY	\$	180.00	130.44	\$	23,479.20
ADA Parking Sign	EA	S	200.00	2	S	400.00
Lot Name Sign	EA	\$	1,000.00	1	\$	1,000.00
Storm Sewer 12 in PVC	LF	\$	59.10	200	\$	11,820.00
Materials & Labor					\$	236,068.88
Contingency				10%	\$	23,606.89
Total					\$	259,500.00
Lot	Design	Alt	ernative	1		
Goldfinch	Biocell	PCC	2			
Item	Unit	Un	it Cost	Qty	Cost	
Driveway PC Concrete 6 in	SY	\$	60.72	1489.51	\$	90,443.05
Sidewalk 4in	SY	\$	50.28	34.67	\$	1,743.21
Topsoil	CY	\$	25 11	40.70	¢	
6 in Curb & Gutter				16./6	Q	420.84
Domount of Drugmont	LF	\$	40.01	16.76	\$	420.84
Removal of Pavement	LF SY	\$ \$	40.01 8.90	16.76 558.18 2245	5 5 5	420.84 22,332.78 19,980.50
Excavation Class 10	LF SY CY	\$ \$ \$	40.01 8.90 6.95	16.76 558.18 2245 496.5	\$ \$ \$	420.84 22,332.78 19,980.50 3,450.68
Excavation Class 10 Granular Subbase	LF SY CY SY	\$ \$ \$ \$	40.01 8.90 6.95 8.06	16.76 558.18 2245 496.5 1489.51	\$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45
Excavation Class 10 Granular Subbase Green Fencing	LF SY CY SY LF	\$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00	16.76 558.18 2245 496.5 1489.51 194.5	\$ \$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole	LF SY CY SY LF EA	\$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00	16.76 558.18 2245 496.5 1489.51 194.5 2	\$ \$ \$ \$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	LF SY CY SY LF EA EA	\$ \$ \$ \$ \$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00	16.76 558.18 2245 496.5 1489.51 194.5 2 2 2	\$ \$ \$ \$ \$ \$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake	LF SY CY SY LF EA EA EA	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61	16.76 558.18 2245 496.5 1489.51 194.5 2 2 2 0	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	LF SY CY SY LF EA EA EA AC	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47	16.76 558.18 2245 496.5 1489.51 194.5 2 2 2 0 0.0477	5 5 5 5 5 5 5 5 5 5	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 - - 164.06
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers	LF SY CY SY LF EA EA EA EA SY	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47 102.15	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 - - 164.06 34,552.24
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell	LF SY CY SY LF EA EA EA AC SY SY	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47 102.15 180.00	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25 130.44	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 - - 164.06 34,552.24 23,479.20
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign	LF SY CY SY LF EA EA EA AC SY SY EA	S S	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47 102.15 180.00 200.00	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25 130.44 2	S S	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 - - 164.06 34,552.24 23,479.20 400.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign	LF SY CY SY LF EA EA EA SY SY EA EA EA	S S	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47 102.15 180.00 200.00 1,000.00	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25 130.44 2 1	S S	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 - - 164.06 34,552.24 23,479.20 400.00 1,000.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC	LF SY CY SY LF EA EA EA SY SY EA EA LF	\$ \$	40.01 8.90 6.95 8.06 40.00 1,200.00 3,388.61 3,439.47 102.15 180.00 200.00 1,000.00 59.10	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25 130.44 2 1 200	S S	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 164.06 34,552.24 23,479.20 400.00 1,000.00 11,820.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC Materials & Labor	LF SY CY SY LF EA EA EA SY SY EA EA LF	S S	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47 102.15 180.00 200.00 1,000.00 59.10	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25 130.44 2 1 200	S S	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00
Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers Biocell ADA Parking Sign Lot Name Sign Storm Sewer 12 in PVC Materials & Labor Contingency	LF SY CY SY LF EA EA EA AC SY SY EA EA LF	S S S S S S S S S S S S S S S S S S S S S S S S S S	40.01 8.90 6.95 8.06 40.00 1,200.00 400.00 3,388.61 3,439.47 102.15 180.00 200.00 1,000.00 59.10	16.76 558.18 2245 496.5 1489.51 194.5 2 2 0 0.0477 338.25 130.44 2 1 200 	S S	420.84 22,332.78 19,980.50 3,450.68 12,005.45 7,780.00 2,400.00 800.00 - - 164.06 34,552.24 23,479.20 400.00 11,000.00 11,820.00 232,772.01 23,277.20

Lot	Design	Alternative			
Goldfinch	Permeable	HMA			
Item	Unit	Unit Cost	Qty	Cost	
Commerical HMA 6in	Ton	\$ 186.51	311.94	\$	58,179.93
Sidewalk 4in	SY	\$ 50.28	34.67	\$	1,743.21
Topsoil	CY	\$ 25.11	38.5	\$	966.74
6 in Curb & Gutter	LF	\$ 40.01	781.04	\$	31,249.41
Removal of Pavement	SY	\$ 8.90	2245	\$	19,980.50
Excavation Class 10	CY	\$ 6.95	308.09	\$	2,141.23
Granular Subbase	SY	\$ 8.06	924.28	\$	7,449.70
Green Fencing	LF	\$ 40.00	194.5	\$	7,780.00
Light Pole	EA	\$ 1,200.00	2	\$	2,400.00
Light Fixture	EA	\$ 400.00	2	\$	800.00
Intake	EA	\$ 3,388.61	0	\$	-
Seeding and Fertilization	AC	\$ 3,439.47	0.0477	\$	164.06
Permeable Pavers	SY	\$ 102.15	851.88	\$	87,019.54
ADA Parking Sign	EA	\$ 200.00	2	\$	400.00
Lot Name Sign	EA	\$ 1,000.00	1	\$	1,000.00
Subdrain 6 in	LF	\$ 20.70	279.51	\$	5,785.86
Perforated Subdrain 6 in	LF	\$ 14.65	579.12	\$	8,484.11
Storm Sewer 8 in PVC	LF	\$ 19.20	89.9	\$	1,726.08
Storm Sewer 12 in PVC	LF	\$ 59.10	100	\$	5,910.00
Materials & Labor				\$	243,180.35
Contingency			10%	\$	24,318.04
Total				\$	267,500.00
Let	Design	Alternative	1		
Coldfinch	Design	Anternative			
Goldminn	renneable	FUU			
ltem	Unit	Unit Cost	Otv	Cost	
Item Driveway PC Concrete 6 in	Unit SY	Unit Cost \$ 60.72	Qty 924.28	Cost S	56,122,28
ltem Driveway PC Concrete 6 in Sidewalk 4in	Unit SY SY	Unit Cost \$ 60.72 \$ 50.28	Qty 924.28 34.67	Cost \$ \$	56,122.28
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil	Unit SY SY CY	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11	Qty 924.28 34.67 38.5	Cost \$ \$ \$	56,122.28 1,743.21 966.74
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter	Unit SY SY CY LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01	Qty 924.28 34.67 38.5 781.04	Cost \$ \$ \$ \$	56,122.28 1,743.21 966.74 31.249.41
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement	Unit SY SY CY LF SY	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90	Qty 924.28 34.67 38.5 781.04 2245	Cost \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19 980 50
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	Unit SY SY CY LF SY CY	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95	Qty 924.28 34.67 38.5 781.04 2245 308.09	Cost S S S S S S S	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2.141.23
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	Unit SY SY CY LF SY CY SY	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28	Cost S S S S S S S S S	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	Unit SY SY CY LF SY CY SY LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194 5	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	Unit SY SY CY LF SY CY SY LF EA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	Unit SY SY CY LF SY CY SY LF EA EA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake	Unit SY SY CY LF SY CY SY LF EA EA EA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3.388.61	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2 0	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	Unit SY SY CY LF SY CY SY LF EA EA EA EA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3 439 47	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2 0 0 0.0477	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 -
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers	Unit SY SY CY LF SY CY SY LF EA EA EA EA SY	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2 0 0 0.0477 851.88	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87.019.54
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 0 0 0.0477 851.88	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87,019.54 400.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA FA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1 000.00	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 0 0 0.0477 851.88 2 1	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87,019.54 400.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Subdrain 6 in	Unit SY SY CY LF SY CY SY LF EA EA EA EA AC SY EA EA	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 20.70	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2 0 0.0477 851.88 2 1 279.51	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - - 164.06 87,019.54 400.00 1,000.00 5,785.86
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Subdrain 6 in Perforated Subdrain 5 in	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA LF LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 20.70 \$ 14.65	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2 0 0 0.0477 851.88 2 1 279.51 279.51	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Subdrain 6 in Perforated Subdrain 6 in Storm Sever 8 in PVC	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA LF EA LF LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 20.70 \$ 14.65 \$ 19.20	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 2 0 0 0.0477 851.88 2 1 1 279.51 579.12	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87,019.54 400.00 1,000.00 5,785.86 8,484.11 1,726.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Subdrain 6 in Perforated Subdrain 6 in Storm Sewer 8 in PVC	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA LF EA LF LF LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 1,000.00 \$ 20.70 \$ 14.65 \$ 19.20 \$ 59.10	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 0 0 0.0477 851.88 2 1 279.51 579.12 89.9	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87,019.54 400.00 1,000.00 5,785.86 8,484.11 1,726.08 5,910.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Subdrain 6 in Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 12 in PVC	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA LF EA LF LF LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 400.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 20.70 \$ 14.65 \$ 19.20 \$ 59.10	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 0 0 0.0477 851.88 2 1 279.51 579.12 89.9 100	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87,019.54 400.00 1,000.00 5,785.86 8,484.11 1,726.08 5,910.00
Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization Permeable Pavers ADA Parking Sign Lot Name Sign Subdrain 6 in Perforated Subdrain 6 in Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor	Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA LF LF LF LF LF	Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 102.15 \$ 200.00 \$ 1,000.00 \$ 20.70 \$ 14.65 \$ 19.20 \$ 59.10	Qty 924.28 34.67 38.5 781.04 2245 308.09 924.28 194.5 2 2 0 0 0.0477 851.88 2 2 1 279.51 579.12 89.9 100	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	56,122.28 1,743.21 966.74 31,249.41 19,980.50 2,141.23 7,449.70 7,780.00 2,400.00 800.00 - 164.06 87,019.54 400.00 1,000.00 5,785.86 8,484.11 1,726.08 5,910.00 241,122.71

Lot	Design	Alternative	1		
Goldfinch	Traditional	HMA			
Golumen	Haditional	11008			
ltem	Unit	Unit Cost	Otv	Cost	
Commerical HMA 6in	Ton	\$ 186.51	599.46	< c	111 805 28
Sidewalk Ain	sv	\$ 50.28	34.67	č	1 743 21
Topsoil	cv	\$ 25.11	38.5	¢	966 74
5 in Curb & Cutter	LE	\$ 40.01	781.04	¢	31 249 41
Pemoval of Pavement	sv	\$ 8.90	2245	¢	10 080 50
Excavation Class 10	cv	\$ 6.95	592.05	¢	4 114 75
Granular Subbase	sv	\$ 8.06	1776.17	¢	14 315 93
Green Fencing	IF	\$ 40.00	104.5	¢	7 780 00
Light Pole	EA	\$ 1 200.00	204.0	¢	2,400,00
Light Fixture	EA	\$ 400.00	2	с с	2,400.00
Intake	EA	\$ 3 399 61	2	с с	6 777 22
Seeding and Fertilization		\$ 3,388.01	0.0477	с с	164.06
ADA Parking Sign	EA	\$ 3,439.47	0.0477	э с	104.00
Lot Name Sign	EA	\$ 1,000,00	2	э с	1 000 00
Storm Sower 8 in DVC		\$ 1,000.00	64.5	э с	1,000.00
Storm Sewer 12 in BVC		\$ 19.20	100	э с	5 010 00
Materials & Jahor	Lr	\$ 59.10	100	\$ ¢	3,910.00
Contingency			1.09/	\$ ¢	210,045.50
Tatal			10%	\$ ¢	21,004.55
Total				<u>ې</u>	231,500.00
Lot	Design	Alternative			
Lot Goldfinch	Design Traditional	Alternative PCC			
Lot Goldfinch	Design Traditional	Alternative PCC			
Lot Goldfinch Item	Design Traditional Unit	Alternative PCC Unit Cost	Qty	Cost	
Lot Goldfinch Item Driveway PC Concrete 6 in	Design Traditional Unit SY	Alternative PCC Unit Cost \$ 60.72	Qty 1776.17	Cost \$	107,849.04
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in	Design Traditional Unit SY SY	Alternative PCC Unit Cost \$ 60.72 \$ 50.28	Qty 1776.17 34.67	Cost \$ \$	107,849.04 1,743.21
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil	Design Traditional Unit SY SY CY	Alternative PCC Unit Cost \$ 60.72 \$ 50.28 \$ 25.11	Qty 1776.17 34.67 38.5	Cost \$ \$ \$	107,849.04 1,743.21 966.74
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter	Design Traditional Unit SY SY CY LF	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01	Qty 1776.17 34.67 38.5 781.04	Cost \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement	Design Traditional Unit SY SY CY LF SY	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90	Qty 1776.17 34.67 38.5 781.04 2245	Cost \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10	Design Traditional Unit SY SY CY LF SY CY	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95	Qty 1776.17 34.67 38.5 781.04 2245 592.05	Cost S S S S S S S	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase	Design Traditional Unit SY SY CY LF SY CY SY SY	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17	Cost S S S S S S S S	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing	Design Traditional Unit SY SY CY LF SY CY SY LF	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole	Design Traditional Unit SY SY CY LF SY CY SY CY SY LF EA	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2	Cost S S S S S S S S S S S S	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 2 2	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA AC	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 2 0.0477	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 1,200.00 \$ 3,388.61 \$ 3,439.47 \$ 200.00	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 2 0.0477 2	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06 400.00
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA	Alternative PCC \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 1,200.00 \$ 3,388.61 \$ 3,439.47 \$ 200.00 \$ 1,000.00	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 0.0477 2 1	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06 400.00 1,000.00
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA	Alternative PCC Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 200.00 \$ 1,000.00 \$ 19.20	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 2 0.0477 2 1 64.5	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06 400.00 1,000.00 1,238.40
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA EA EA EA	Alternative PCC Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 1,200.00 \$ 3,388.61 \$ 3,439.47 \$ 200.00 \$ 1,000.00 \$ 19.20 \$ 59.10	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 2 2 0.0477 2 1 64.5 100	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06 400.00 1,000.00 1,238.40 5,910.00
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA LF LF	Alternative PCC Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 200.00 \$ 1,000.00 \$ 19.20 \$ 59.10	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 2 0.0477 2 1 1 64.5 100	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06 400.00 1,000.00 1,238.40 5,910.00 206,689.26
Lot Goldfinch Item Driveway PC Concrete 6 in Sidewalk 4in Topsoil 6 in Curb & Gutter Removal of Pavement Excavation Class 10 Granular Subbase Green Fencing Light Pole Light Fixture Intake Seeding and Fertilization ADA Parking Sign Lot Name Sign Storm Sewer 8 in PVC Storm Sewer 12 in PVC Materials & Labor Contingency	Design Traditional Unit SY SY CY LF SY CY SY LF EA EA EA EA EA EA EA EA LF LF	Alternative PCC Unit Cost \$ 60.72 \$ 50.28 \$ 25.11 \$ 40.01 \$ 8.90 \$ 6.95 \$ 8.06 \$ 40.00 \$ 1,200.00 \$ 400.00 \$ 3,388.61 \$ 3,439.47 \$ 200.00 \$ 1,000.00 \$ 1,000.00 \$ 19.20 \$ 59.10	Qty 1776.17 34.67 38.5 781.04 2245 592.05 1776.17 194.5 2 2 2 0.0477 2 1 1 64.5 100	Cost \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	107,849.04 1,743.21 966.74 31,249.41 19,980.50 4,114.75 14,315.93 7,780.00 2,400.00 800.00 6,777.22 164.06 400.00 1,000.00 1,238.40 5,910.00 206,689.26 20,668.93

Appendix C Detailed Cost Estimation Building

Assembly	Count	Unit	Unit Cost (2011)	Unit Cost (current)	Total
Footing	127.83	ft	\$32.91	\$42.39	\$5,418.47
Foundation Wall	128.2	ft	\$67.19	\$86.54	\$11,094.52
First Floor Slab	646	sf	\$12.18	\$15.69	\$10,134.34
Asphalt Roof Shingle	927.6	sf	\$1.74	\$2.24	\$2,078.86
Roof Truss	655	sf	\$5.10	\$6.57	\$4,302.56
CMU Walls	1070	sf	\$9.39	\$12.09	\$12,940.92
2x3 Window	1	each	\$449	\$578.31	\$578.31
2x4 Window	5	each	608	\$783.10	\$3,915.52
3'x7' Wood Door	3	each	426	\$548.69	\$1,646.06
Curtain Walls	253	sf	\$19.55	\$25.18	\$6,370.64
2" Fiberboard Insulation	1997.6	sf	\$1.53	\$1.97	\$3,936.55
Gutter	128	ft	\$10.66	\$13.73	\$1,757.45
Interior Walls	135	sf	\$5.05	\$6.50	\$878.09
Msc. Bathroom	1	each	\$670	\$862.96	\$862.96
Tile Flooring	380	sf	\$9.59	\$12.35	\$4,693.73
Interior Painting	1340	sf	\$0.70	\$0.90	\$1,208.14
Suspended Ceiling	655	sf	\$3.08	\$3.97	\$2,598.41
Toilet	1	each	\$2,035	\$2,621.08	\$2,621.08
Bathroom Sink	1	each	\$1,630	\$2,099.44	\$2,099.44
Water Heater	1	each	\$5,075	\$6,536.60	\$6,536.60
Water Piping	60.83	ft	\$26.80	\$34.52	\$2,099.75
Heating	380	sf heated	\$13.81	\$17.79	\$6,759.17
AC	380	sf cooled	\$15.80	\$20.35	\$7,733.15
Light Switch	2	each	\$217	\$279.50	\$558.99
Outlet	4	each	\$213	\$274.34	\$1,097.38
Lighting Fixtures	646	sf	\$7.52	\$9.69	\$6,257.00
Office Furniture	2	person	\$585	\$753.48	\$1,506.96
Sanitary Sewer Piping	20	ft	\$4.95	\$6.38	\$127.51
Subtotal					\$111,812.59
Contingencies				20%	\$22,362.52
Total					\$134,000.00

Appendix D Design Specifications, Standards, and Guideline

D.1 Design Specifications

Specification	#	Source	Notes
Sidewalk Cross Slope	Max 5%	Sudas Chapter 12	
	Min		
Sidewalk Cross Slope	0.5%	Sudas Chapter 12	
Sidewalk Width	5'	Sudas Chapter 12	
	Max		
Sidewalk Running Slope	8.3%	Sudas Chapter 12	
Parking Lot Pavement Slope	Max 5%	Sudas Chapter 8	
	Min		
Parking Lot Pavement Slope	0.5%	Sudas Chapter 8	
ADA Parking Lot Area	Max 2%	Sudas Chapter 8	
PCC Pavement Depth	Min 5"	Sudas Chapter 8	CBR 3 Medium Traffic
PCC Rock Depth	Min 6"	Sudas Chapter 8	CBR 3 Medium Traffic
HMA Pavement Depth	Min 6"	Sudas Chapter 8	

HMA Rock Depth	Min 8"	Sudas Chapter 8	
Stall Width	9'	Sudas Chapter 8	60 Degree stalls
Drive Lane Width	20.3'	Sudas Chapter 8	60 Degree stalls
Entrance Width	24'	Sudas Chapter 8	
ADA Van Accessible Spot	8'	Sudas Chapter 8	
ADA Van Landing with Spot			
on Each Side	8'	Sudas Chapter 8	

Symbol	#	Definition	Source
D	57.5	Pole Spacing	Drawing
	6802.98		
LL	4	Initial Lamp Lumens	Equation
CU	0.3	Coefficient of Utilization	Manufacturer
LLD	0.9	Lamp Lumen Depreciation	Sudas
LDD	0.9	Luminaire Dirt Depreciation	Sudas
			Sudas Table 8C-
Eh	0.5	Average Maintained Level of Illumination	1.05
W	57.5	Farthest Distance from light needing illumination	Drawing

	XSPSM LED Street/Area Luminaire - Small w/ BLS 8L 2700				
Model	8L 2700	Lumens - 5225			

Symbol	#	Definition	Source
LL	5225	Lamp Lumens	Manufacturer
CU			
Update	0.4	Coefficient of Utilization (Manufacturer)	Manufacturer
LLD	0.9	Lamp Lumen Depreciation	Sudas
LDD	0.9	Luminaire Dirt Depreciation	Sudas
			Sudas Table 8C-
EH	0.5	Average Maintained Level of Illumination	1.05
W	57.5	Farthest Distance from light needing illumination	Drawing
	58.8834		
D	8	Pole Spacing	Equation

D.2 Design Standards

Bhatti, Asghar. Design of Concrete Structures - Fundamentals and Practices. University of Iowa, 2021.
Coduto, Donald P., et al. Foundation Design: Principles and Practices. Pearson, 2016.
Encyclopedia of Trusses: A Guide to Using Trusses, Alpine Engineered Products, 2019, pp. 1–28.

International Code Council. International Building Code. Falls Church, Va.: International Code Council, 2000.

Minimum Design Loads and Associated Criteria for Buildings and Other Structures: ASCE/SEI 7-16. American Society of Civil Engineers, 2017.

"TEK Index." NCMA, 17 Nov. 2020, https://ncma.org/resource/tek-index/.

D.3 Guidelines Used in Design Phase

Bhatti, Asghar. *Design of Concrete Structures - Fundamentals and Practices*. University of Iowa, 2021.
Coduto, Donald P., et al. *Foundation Design: Principles and Practices*. Pearson, 2016. *Encyclopedia of Trusses: A Guide to Using Trusses*, Alpine Engineered Products, 2019, pp. 1–28.
"TEK Index." *NCMA*, 17 Nov. 2020, <u>https://ncma.org/resource/tek-index/</u>.