

Jonesborough Municipal Garage Complex Conceptual Site Master Plan



Prepared for the Town of Jonesborough, TN

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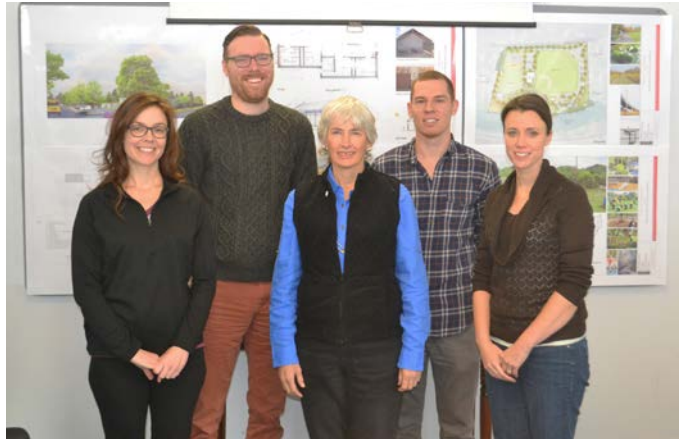
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The Community Design Assistance Center (CDAC) is an outreach center in the College of Architecture and Urban Studies at Virginia Tech that assists communities, neighborhood groups, and non-profit organizations in improving the natural and built environments. Assistance is provided in the areas of landscape architecture, architecture, planning, and interior design. Working with communities, the conceptual planning and designs provide communities with a graphic vision of their project that can then be used for grant applications and fundraising for the next steps toward implementation.

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ACKNOWLEDGMENTS

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Jonesborough Board of Mayor and Aldermen

Jonesborough Tree and Townscape Committee

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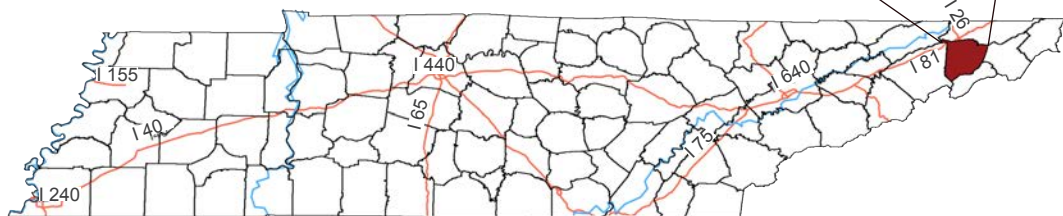
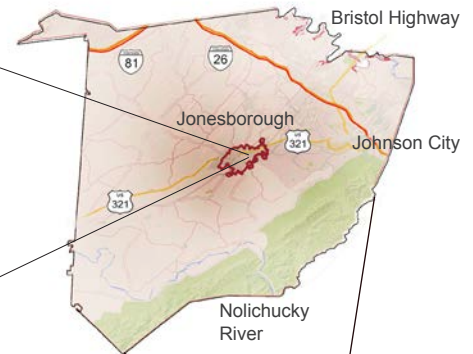
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PROJECT DESCRIPTION



Above: Proposed Municipal Garage Complex Site



Tennessee state map showing the location of Washington County and major interstates.
Above Right: Washington County map showing the location of the Town of Jonesborough.

Tennessee's oldest town, Jonesborough, is known for its historic preservation, small-town charm, and the International Storytelling Festival. It is a popular destination for both locals and tourists. The town offers its residents a number of recreational opportunities including Wetlands Water Park, Persimmon Ridge Park, the Mary B. Martin Program for the Arts, and the Jonesborough Repertory Theatre. Another popular destination is Jonesborough's Senior Citizen Center. The center offers "a variety of events and trips, opportunities for outreach to the community, education, socializing, health and fitness, and spiritual and vocational classes." Although the population of Jonesborough was only 5,975 in the 2010 census, the Senior Citizen Center serves the broader Washington County area and has approximately 2,000 members. In addition, it has over 350 volunteers who help manage and operate the center.

In 2014, the Town of Jonesborough began constructing a new facility for the Senior Citizen Center in order to better meet the needs of its members. The new location is closer to the downtown area and will be more easily accessible. Construction is expected to be completed in the spring of 2015. The new center neighbors the town's municipal garage and is located in the Longview Drive/North Lincoln Street neighborhood.

PROJECT DESCRIPTION

Although the town has actively tried to screen the municipal garage area and its activities from the surrounding neighborhood, they feel that the construction of the new Senior Citizen Center offers an opportunity to remove the municipal garage to a more appropriate location and then utilize the vacated land as an asset - a park that serves the seniors and the surrounding neighborhood.

The Town of Jonesborough requested that the Community Design Assistance Center help in the site planning for the new municipal garage and the redesign of the current municipal garage property. The new municipal garage site is located in the floodplain of Little Limestone Creek, so special attention was paid to the floodway and the appropriate type of development for the site. In addition, the town wanted to minimize any impacts of the new facility on neighboring residents.

It was envisioned that the current municipal garage property would be redeveloped into a senior citizen/neighborhood park. This park would serve the needs of the Longview Drive/North Lincoln Street neighborhood as well as the Senior Citizen Center.

The site planning for the new municipal garage is described in this report. The conceptual design for the park is described in a separate report.

DESIGN PROCESS

The design process began with an initial site visit to Jonesborough in November 2014. The CDAC team walked the municipal garage site (future location of the North Lincoln Avenue Community Park) where they photographed the site and conducted a site analysis. The team also met with various town personnel. By gathering on-site data, documenting existing conditions, and taking soil samples, the team was able to understand the opportunities and constraints of each site. This analysis would later influence the design concepts. The team also visited Blacksburg and Roanoke fleet facilities to better understand the processes at these complexes.

In December 2015, the CDAC team had the opportunity to meet with stakeholders to discuss concerns and desires for the project. The team worked closely with the staff to better understand their vision for the municipal garage complex. After further dialogue and careful consideration of all the factors, a set of preliminary conceptual design alternatives was developed. These designs were presented at a meeting where they were reviewed and commented on by stakeholders. The design alternatives were then revised and combined into a final conceptual master plan for the project site based on the comments made at the meeting.

The final conceptual master plans were presented at a second and final meeting.



The CDAC team meeting with stakeholders.



CDAC project manager, Lara Browning, presenting final conceptual designs at a meeting.

PART 1: FINAL DESIGNS

MUNICIPAL GARAGE COMPLEX FINAL DESIGN

Final Master Plan

Two final concepts were completed for the Jonesborough Municipal Garage Complex. The first envisions the best possible scenario for the site once an existing solid waste building has come to the end of its life-cycle. The second concept involves a site plan with the existing solid waste facility building intact.

At the outset of design development careful consideration was given to the floodplain, slope, views from surrounding residential areas, and utilities of the site. The design was approached with a few goals in mind:

1. Ability to complete phases with the first phase allowing for the street, water and meter, and fleet departments to move from the current municipal garage site on North Lincoln Avenue.
2. Need to control access to the site and to separate the public from town operations.
3. Design the site to allow for easy flow of traffic and minimal congestion, reducing the likelihood of accidents.
4. Centralize the fleet services, but separate it from the general municipal complex traffic flow.
5. Consideration of what services need to be close to the entry and exit of the site. For example, the general wash bay should be close to the entry, while the fuel island should be close to the exit.
6. Allowing the complex to function with or without crossing the railroad tracks, although access is preferred.

The municipal garage complex site plan is divided into two sections: the upper and lower sites. The upper site houses the solid waste and recycling and sanitary waste departments. The lower site houses the administration building, street department, water and meter department, and fleet services. Each site has independent main entry points, however it is proposed that the two sites would connect via an access drive across Southern Railroad.

MUNICIPAL GARAGE COMPLEX FINAL DESIGN

The upper site has two layout options. In the plan with the existing solid waste configuration, the public access point is relocated to Britt Drive. Here, a gate would allow the public to drop off debris and pick up mulch, but would limit their access to the rest of the site. The current entry would be closed to the public and converted into a gated pedestrian entrance. The current parking lot would remain for employee parking and office visitors.

While driving down Britt Drive, the first left turn is an entrance protected by a 40 foot long slide gate. Through this gate is the Solid Waste and Recycling complex. Once entering, straight ahead is the main Solid Waste building, which is comprised of a recycle room, cardboard storage, plastic storage, a large expansion, an outdoor area for storage, loading docks, and a large loading and unloading area.

For the layout with the updated solid waste configuration, entering from Main Street, the road splits into two driveways. To the left, the lower driveway takes you down into a cul-de-sac, where the general public can pick up mulch. An eight foot security fence separates the public domain from the facilities departments. On the other side of this fence is an area used to store mulch, an access drive, and a 12 foot wide double swing gate. This allows the employee in charge of mulch delivery easy access to patrons, yet maintains security to the rest of the site.

In both upper site options, employees enter the facility at the end of Britt Drive where there is an existing 20 foot wide double swing gate with key-card entry feature. Once through this gate, there is a four way intersection. Straight through the intersection is a loop drive around the new water treatment facility.

Before entering this loop drive, there is an access road up the hill, adjacent to the centrifuge building, which is used to access the existing brush and grinding area. At the end of this access drive on top of the hill is a large area for material storage. This access drive continues along the highest ridge of the site to a covered storage area for infrequently used vehicles and just beyond is a fenced and gated impound lot that is managed by the town's police department. The impound lot is located here in order to isolate it from the rest of the facility and because it will not need to be accessed as frequently as other facilities. Past the impound lot, there is a fence and automatic gate that links this part of the site to the Sanitary Department's area. This driveway then reconnects back into the road that circumnavigates the water treatment facility.

MUNICIPAL GARAGE COMPLEX FINAL DESIGN

Keeping to the right on the water treatment facility drive will loop the user back around to another four-way section which is situated near the previous four way intersection. This intersection is comprised of stone storage, a large equipment shed, and heated vehicular storage bays for the Sanitary Department. To the right of this intersection is an access drive that crosses the Southern Railway Company's railroad tracks. This access drive should not be used as a primary point of entry into the lower site, but serves as an auxiliary entrance.

The lower site should mainly be accessed from Route 34. The first entrance, located on the east side of the lower site, can only be accessed by town employees with a key card and other vehicles with prior clearance. Once through the entrance gate, the user encounters a four-way intersection. Straight ahead is a one-way loop drive that guides users to the Administration Building, Street, Water, and Meter Departments, wash bay, and fuel island.

The lower site is designed for the majority of traffic flow to pass through this area. First is the Administration Building to the left that houses administrative offices at the far west end of the building, as well as storage areas for the Street Department and Water and Meter Department. As you bear left at the corner of the one-way loop, there is a wash bay on the right that can be accessed by all departments. Beyond that is a salt storage and brining facility, rock/sand/chat storage with a brickyard behind, that is all managed by the Street Department. Beyond this is a fenced-in pipe yard with two 40 foot long slide gates. Within the pipe yard is a long building containing water pipe storage and straw and pipe fitting storage. Across the one-way loop from the pipe yard is a bump-out on the Administration Building, which houses an enclosed pull-through for deliveries. This pull-through is adjacent to a two-story parts room, which is managed by the Inventory Clerk. Continuing along the one-way loop, there is an outdoor area for rock storage, which is managed by the Water and Meter Department. Next to this is a shed for storing drilling machines, which is managed by the Street Department. Finally, next to this is another area managed by the Water Department, which is used for parking large pieces of equipment. Across from this area is another one-way access drive, which leads to a fuel island. Beyond the fuel island is a 20' wide automatic double swing gate, which leads back onto Route 34.

To the right of the four-way intersection at the entrance gate is Fleet Services, which consists of employee parking, a partially covered 20,000 square foot down and ready vehicle area, a large heated building containing a tractor trailer pull-through, five maintenance

MUNICIPAL GARAGE COMPLEX FINAL DESIGN

bays, parts and tools storage, offices, break room, training room, and restrooms. At the end of this one-way loop is an area for trailer parking. This road also leads to the railroad crossing and to the upper site.

To the left of the four-way intersection at the entrance gate is a one-way drive that also leads the user to the administration building. Along this drive, there is access to vehicular storage bays and equipment pipe storage, which is managed by the Street Department in the Administration Building. Across from this building are 20 angled parking spaces, which are reserved for small service and meter trucks for the Water and Meter Department and Street Department. At the west end of this parking area and across the one-way drive, is an outdoor boot wash area and a pedestrian employee entrance which leads into a mud room. This area can also serve as a temporary loading and unloading area for the greenhouse, which can be accessed from outside or inside the Administration Building. Between the eastern one-way entrance and western one-way exit is a third access point into the lower site. This is a two-way access that leads to a large parking lot, which is reserved for employees and visitors and does not require a key card. This parking lot is fenced off from the rest of the site in order to maintain a higher level of security. The general public can only access this section of the site, which leads them to the main entrance to the Administration Building.

In addition to the municipal garage facilities located on the lower site, a 1/3 mile walking path is proposed across from Little Limestone Creek. This path could provide recreational opportunities for town staff and would provide a space for future development of the municipal garage.

Design idea images were collected addressing the concerns listed below for the Jonesborough Municipal Garage Complex. The images can be found on the following page.

Riparian buffers and stormwater treatment areas are also recommended throughout the site to protect Little Limestone Creek from stormwater runoff and to aesthetically enhance the site. Extensive plant buffers are located in areas that prevent unsightly views into the facility from the surrounding neighbors (image 1). In addition to plant buffers, it is recommended that certain buildings, such as the Administration Building, be designed to be more aesthetically pleasing (images 2-3). Other techniques for minimizing the visual impact of the site could include painting storage structures green to blend in with vegetation (image 4) and having buildings that face the public be more aesthetically pleasing (image 5) than those facing the interior of the site (image 6).

MUNICIPAL GARAGE COMPLEX FINAL DESIGN



1. Evergreen plant buffers



2. Aesthetic administration building



3. Aesthetic administration building



4. Storage structures painted green



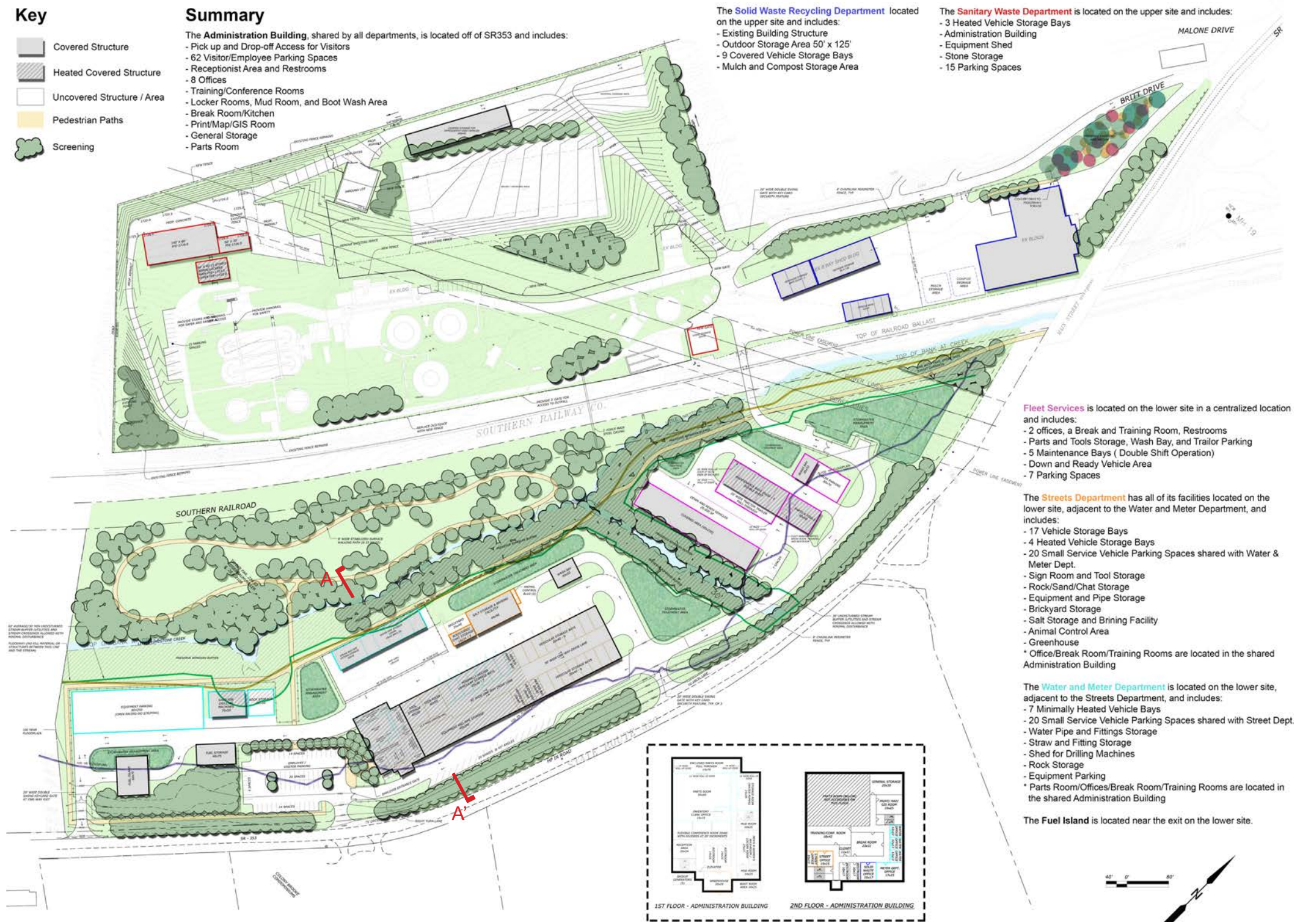
5. Aesthetic storage building front



6. Less aesthetic storage building back






The following pages include the proposed conceptual master plans, a proposed conceptual layout for the Administration Building, a section drawing showing a section through the walking path and Administration Building, and an axonometric perspective of the Municipal Complex Lower Site.

FINAL DESIGN CONCEPTS
Master Plan with Existing Solid Waste Configuration



FINAL DESIGN CONCEPTS
Master Plan with Updated Solid Waste Configuration

Key

-  Covered Structure
-  Heated Covered Structure
-  Uncovered Structure / Area
-  Pedestrian Paths
-  Screening

Summary

The **Administration Building**, shared by all departments, is located off of SR353 and includes:

- Pick up and Drop-off Access for Visitors
- 62 Visitor/Employee Parking Spaces
- Receptionist Area and Restrooms
- 8 Offices
- Training/Conference Rooms
- Locker Rooms, Mud Room, and Boot Wash Area
- Break Room/Kitchen
- Print/Map/GIS Room
- General Storage
- Parts Room

The **Solid Waste Recycling Department** located on the upper site and includes:

- Recycle Room
- Cardboard Storage Area
- Plastic Storage Area
- Loading/Unloading Area/ Bin Storage
- Outdoor Storage Area
- 9 Covered Vehicle Storage Bays
- Mulch and Compost Storage Area
- * Office/Break Room/Training Rooms are located in the shared Administration Building

The **Sanitary Waste Department** is located on the upper site and includes:

- 3 Heated Vehicle Storage Bays
- Administration Building
- Equipment Shed
- Stone Storage
- 15 Parking Spaces

Fleet Services is located on the lower site in a centralized location and includes:

- 2 offices, a Break and Training Room, Restrooms
- Parts and Tools Storage, Wash Bay, and Trailer Parking
- 5 Maintenance Bays (Double Shift Operation)
- Down and Ready Vehicle Area
- 7 Parking Spaces

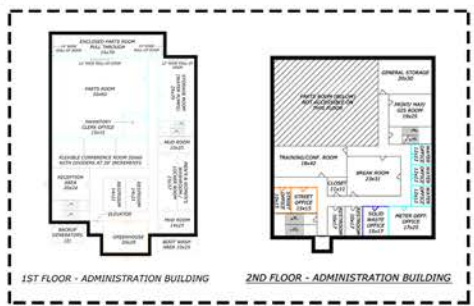
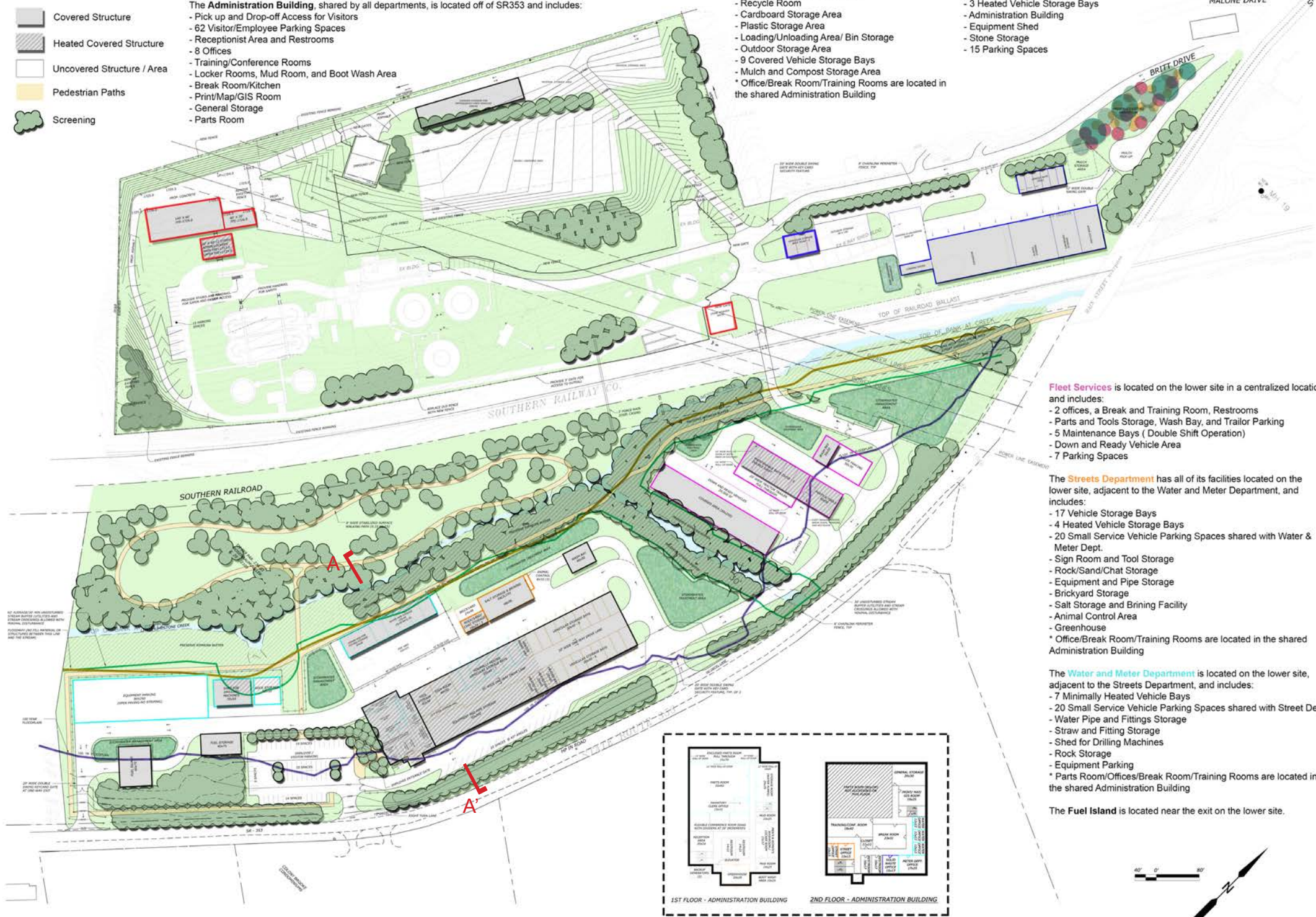
The **Streets Department** has all of its facilities located on the lower site, adjacent to the Water and Meter Department, and includes:

- 17 Vehicle Storage Bays
- 4 Heated Vehicle Storage Bays
- 20 Small Service Vehicle Parking Spaces shared with Water & Meter Dept.
- Sign Room and Tool Storage
- Rock/Sand/Chat Storage
- Equipment and Pipe Storage
- Brickyard Storage
- Salt Storage and Brining Facility
- Animal Control Area
- Greenhouse
- * Office/Break Room/Training Rooms are located in the shared Administration Building

The **Water and Meter Department** is located on the lower site, adjacent to the Streets Department, and includes:

- 7 Minimally Heated Vehicle Bays
- 20 Small Service Vehicle Parking Spaces shared with Street De
- Water Pipe and Fittings Storage
- Straw and Fitting Storage
- Shed for Drilling Machines
- Rock Storage
- Equipment Parking
- * Parts Room/Offices/Break Room/Training Rooms are located in the shared Administration Building

The **Fuel Island** is located near the exit on the lower site.



FINAL DESIGN CONCEPTS
Master Plan with Updated Solid Waste Configuration on Upper Site

Summary

The **Administration Building**, shared by all departments, is located off of SR353 and includes:

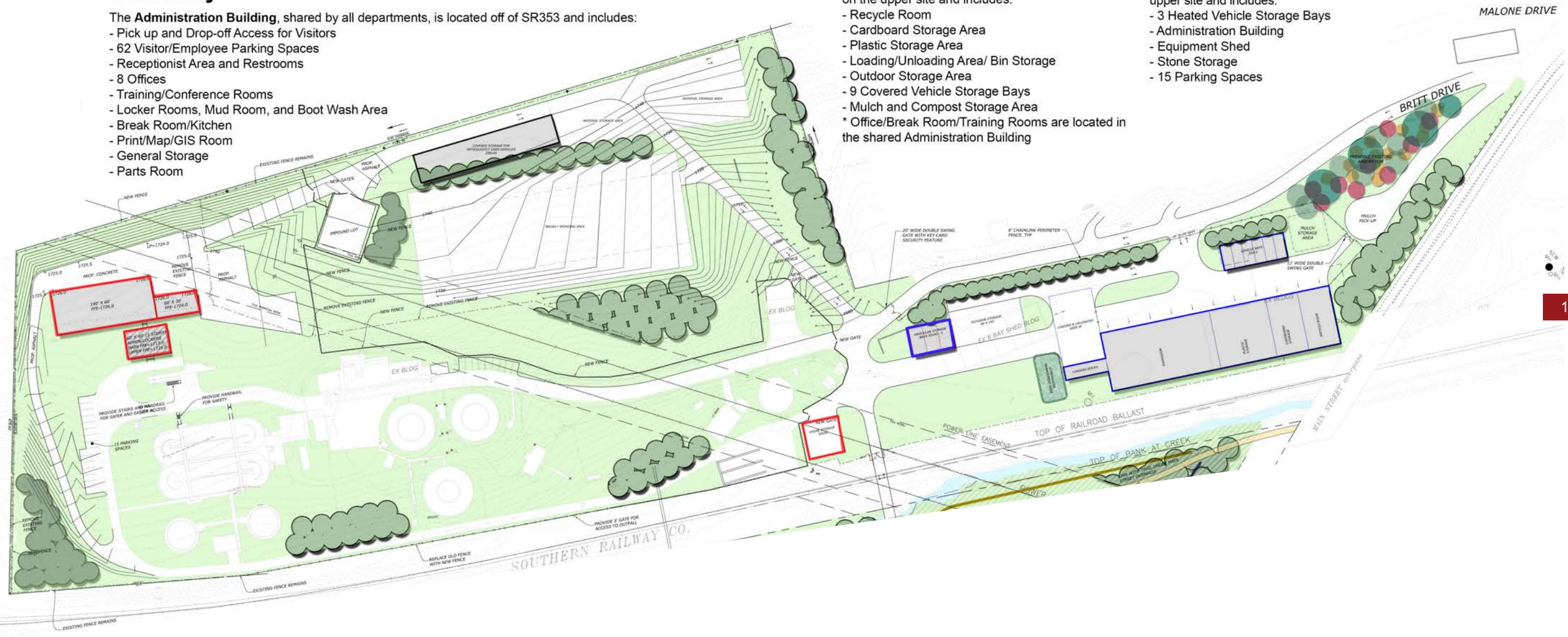
- Pick up and Drop-off Access for Visitors
- 62 Visitor/Employee Parking Spaces
- Receptionist Area and Restrooms
- 8 Offices
- Training/Conference Rooms
- Locker Rooms, Mud Room, and Boot Wash Area
- Break Room/Kitchen
- Print/Map/GIS Room
- General Storage
- Parts Room

The **Solid Waste Recycling Department** located on the upper site and includes:

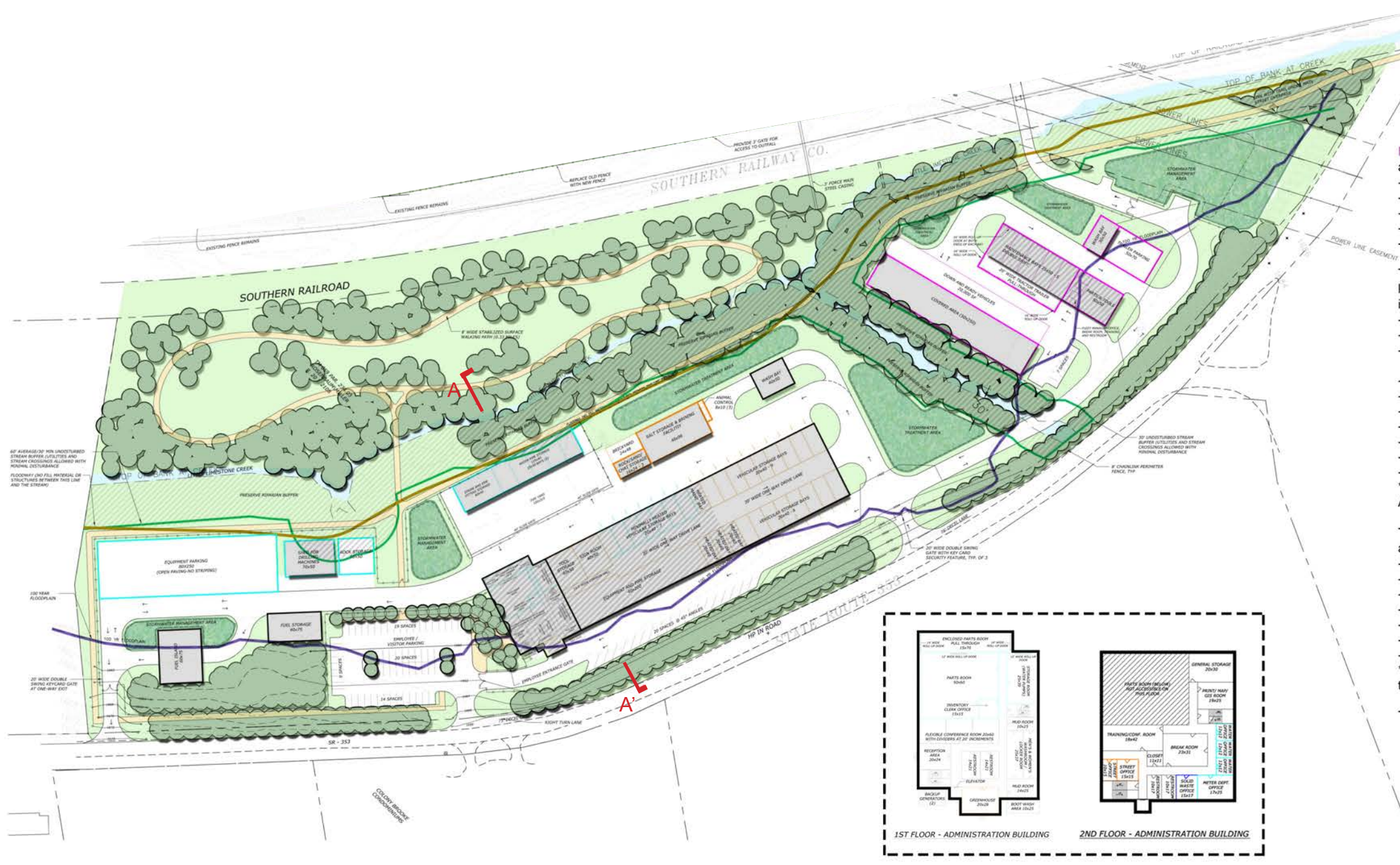
- Recycle Room
- Cardboard Storage Area
- Plastic Storage Area
- Loading/Unloading Area/ Bin Storage
- Outdoor Storage Area
- 9 Covered Vehicle Storage Bays
- Mulch and Compost Storage Area
- * Office/Break Room/Training Rooms are located in the shared Administration Building

The **Sanitary Waste Department** is located on the upper site and includes:

- 3 Heated Vehicle Storage Bays
- Administration Building
- Equipment Shed
- Stone Storage
- 15 Parking Spaces



FINAL DESIGN CONCEPTS
Master Plan of Lower Site



Fleet Services is located on the lower site in a centralized location and includes:

- 2 offices, a Break and Training Room, Restrooms
- Parts and Tools Storage, Wash Bay, and Trailer Parking
- 5 Maintenance Bays (Double Shift Operation)
- Down and Ready Vehicle Area
- 7 Parking Spaces

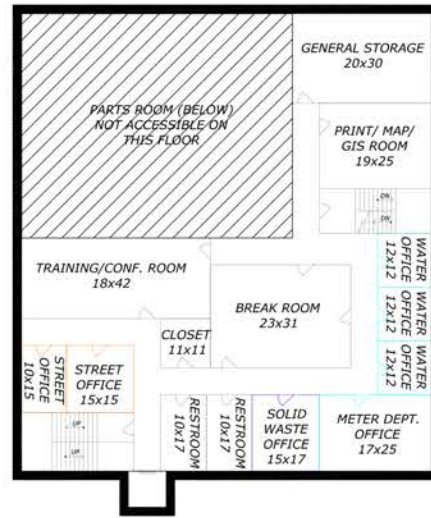
The **Streets Department** has all of its facilities located on the lower site, adjacent to the Water and Meter Department, and includes:

- 17 Vehicle Storage Bays
- 4 Heated Vehicle Storage Bays
- 20 Small Service Vehicle Parking Spaces shared with Water & Meter Dept.
- Sign Room and Tool Storage
- Rock/Sand/Chat Storage
- Equipment and Pipe Storage
- Brickyard Storage
- Salt Storage and Brining Facility
- Animal Control Area
- Greenhouse
- * Office/Break Room/Training Rooms are located in the shared Administration Building

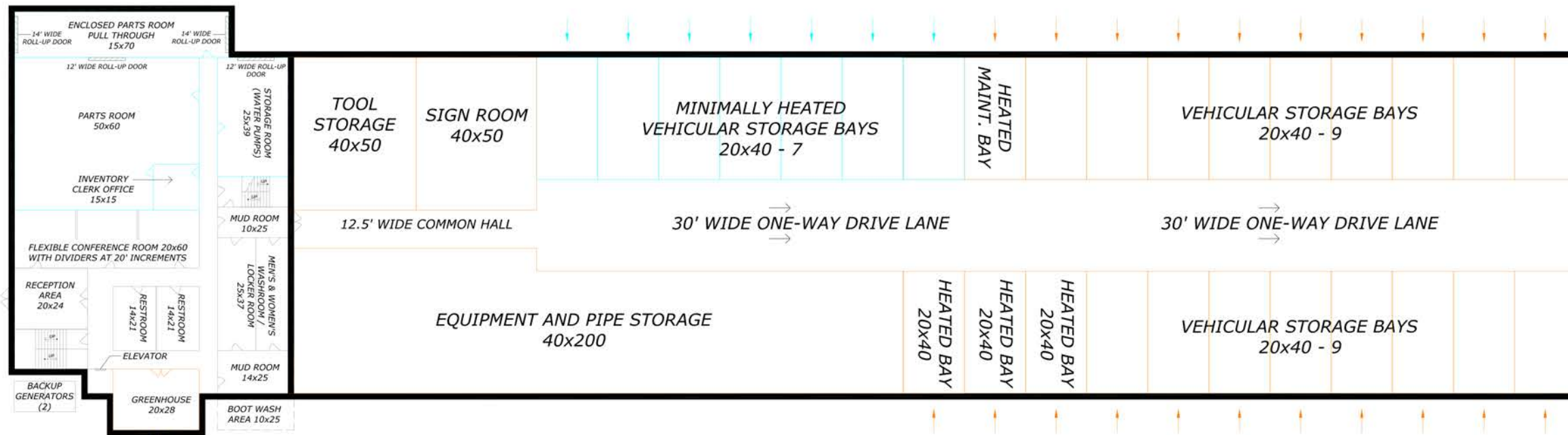
The **Water and Meter Department** is located on the lower site, adjacent to the Streets Department, and includes:

- 7 Minimally Heated Vehicle Bays
- 20 Small Service Vehicle Parking Spaces shared with Street Dept.
- Water Pipe and Fittings Storage
- Straw and Fitting Storage
- Shed for Drilling Machines
- Rock Storage
- Equipment Parking
- * Parts Room/Offices/Break Room/Training Rooms are located in the shared Administration Building

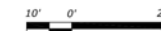
The **Fuel Island** is located near the exit on the lower site.



2ND FLOOR - ADMINISTRATION BUILDING



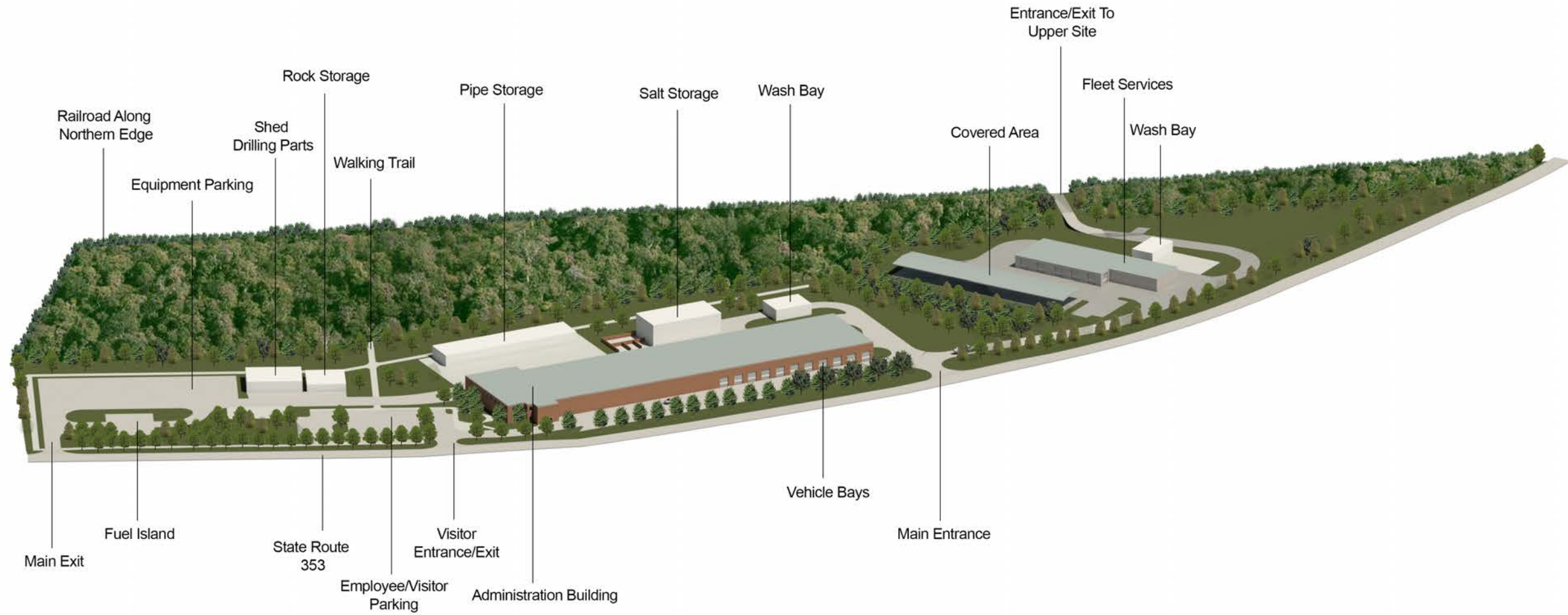
1ST FLOOR - ADMINISTRATION BUILDING



FINAL DESIGN CONCEPTS
Site Section Through Walking Trail and Administration Building



FINAL DESIGN CONCEPTS
Site Axonometric Model of the Municipal Complex Lower Site



CONCLUSION

The Community Design Assistance Center worked closely with the Jonesborough municipal staff to create a design for the new garage complex. This complex will give the town a new and improved site for all of its municipal functions and employees to work. It provides room for growth to allow the staff to continue to provide for the town. It is our hope that this work will provide a more functional, safe, and enjoyable work environment for the Town of Jonesborough's staff.

PART 2: SITE INVENTORY AND ANALYSIS

SITE INVENTORY & ANALYSIS

During the site visits to Jonesborough, the team inventoried existing site elements and analyzed site conditions. The inventory was predominantly based on topography, property ownership, vehicular circulation, open space areas, views, adjacent uses, and surrounding landscape character.

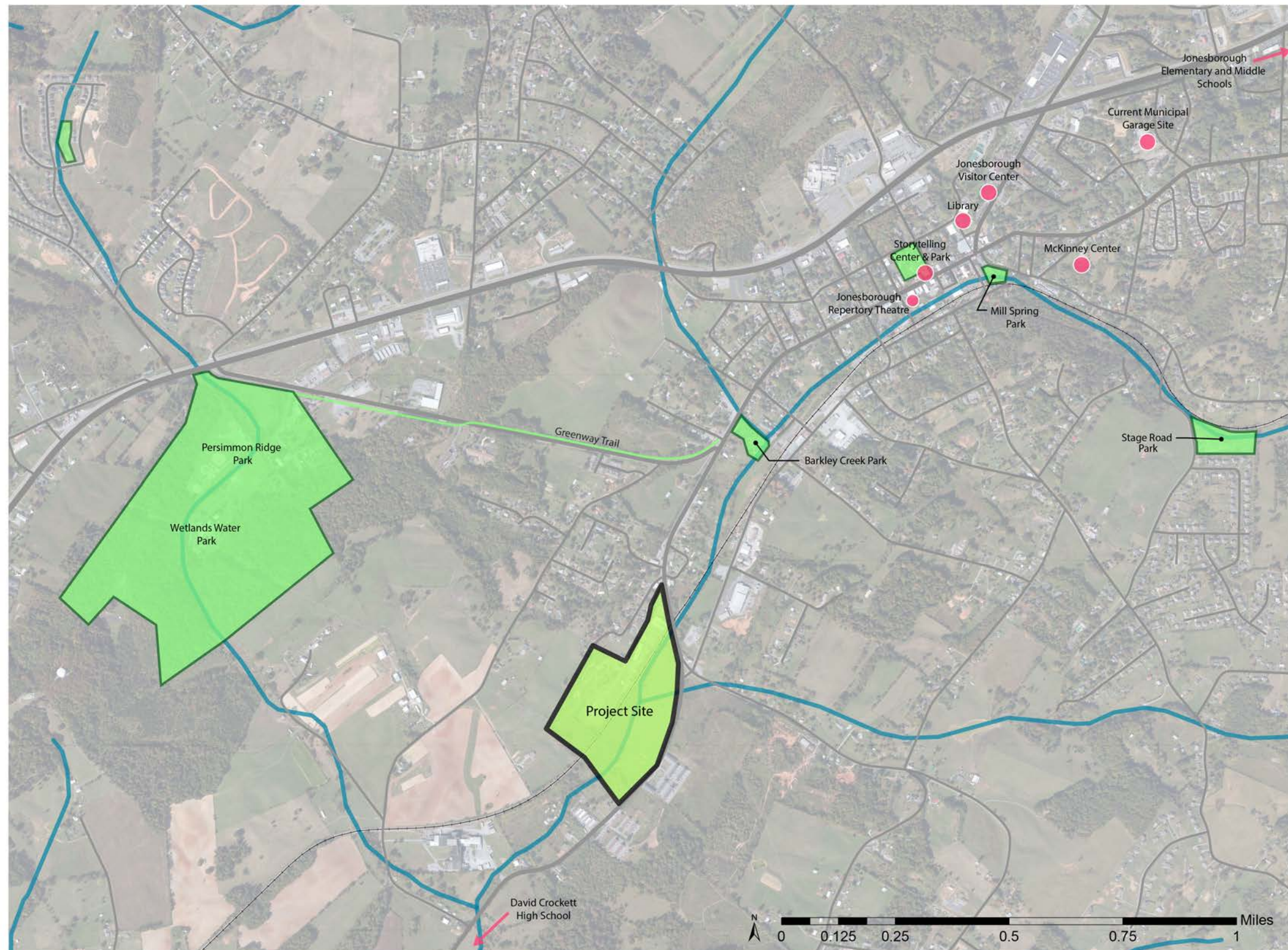
The site of the new municipal garage site is bisected by a railroad line, creating upper and lower sections of the site. The southern portion of the site, sometimes referred to as the Rosenbaum property is comprised of an open field with Little Limestone Creek running through it. This portion of the site is thus relatively flat. The area is comprised of mowed fields used for hay production with vegetated buffers along the stream bank.

The northern portion of the site already houses some existing municipal functions including Jonesborough's water treatment plant, solid waste facility, and a tub grinder area used for debris drop-off and mulch pickup. The tub grinder currently sits on a very steep slope along the northern most edge of the site.

The site as a whole is surrounded by single family homes as well as a couple of apartment complexes to the south. The views from these homes were an important consideration throughout the design process. Main Street runs along the south of the site with downtown Jonesborough to the east.

Site analysis information can be found on the following pages.

SITE INVENTORY
Context



SITE INVENTORY
Existing Conditions



View of apartment complex on State Route 353 with proposed Municipal Garage property in the background.



View looking North on the Rosenbaum property.



View looking South at an apartment complex from the Rosenbaum property.



View of culvert under Main Street.

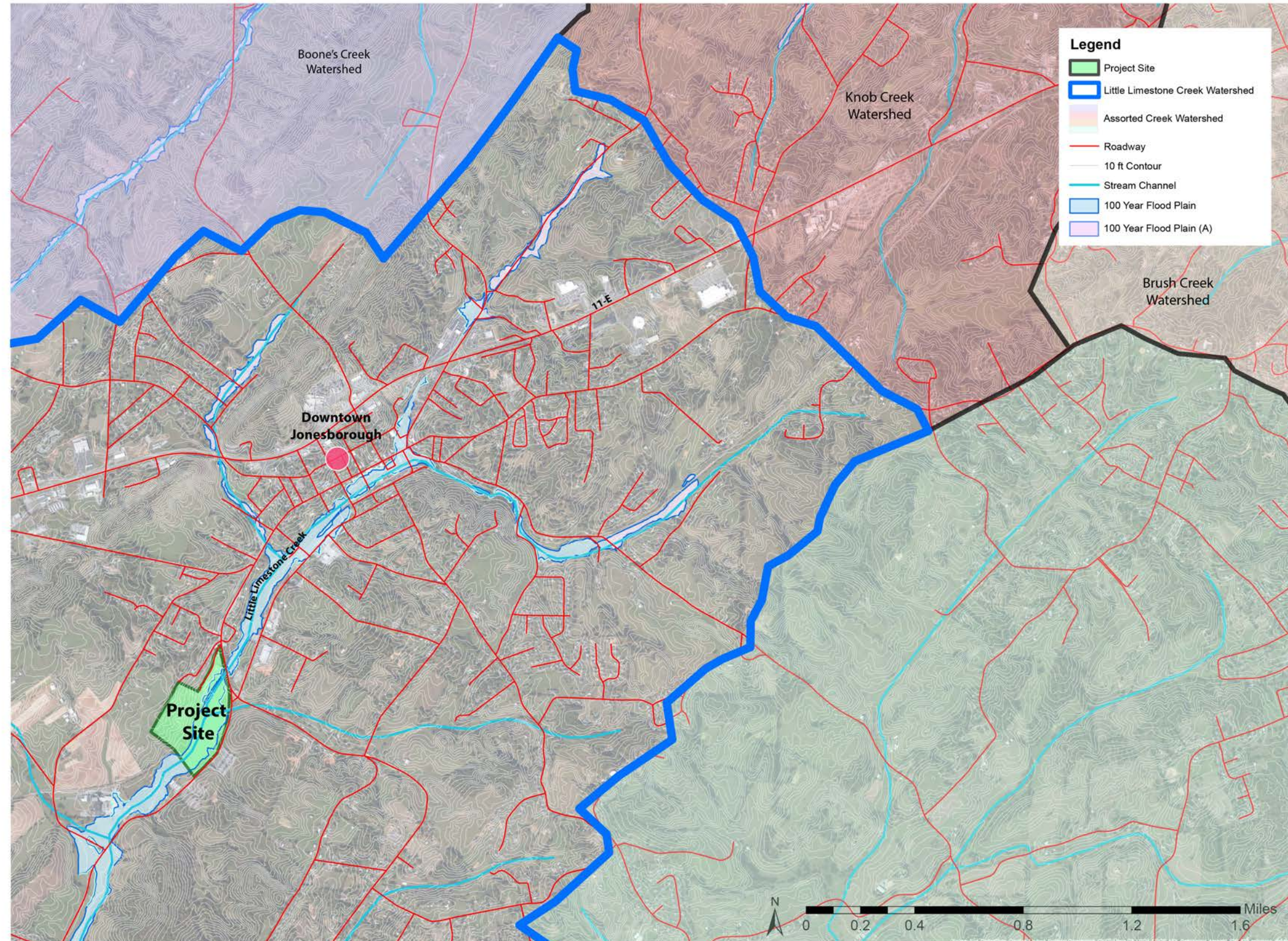


View of existing Solid Waste and Recycling building.



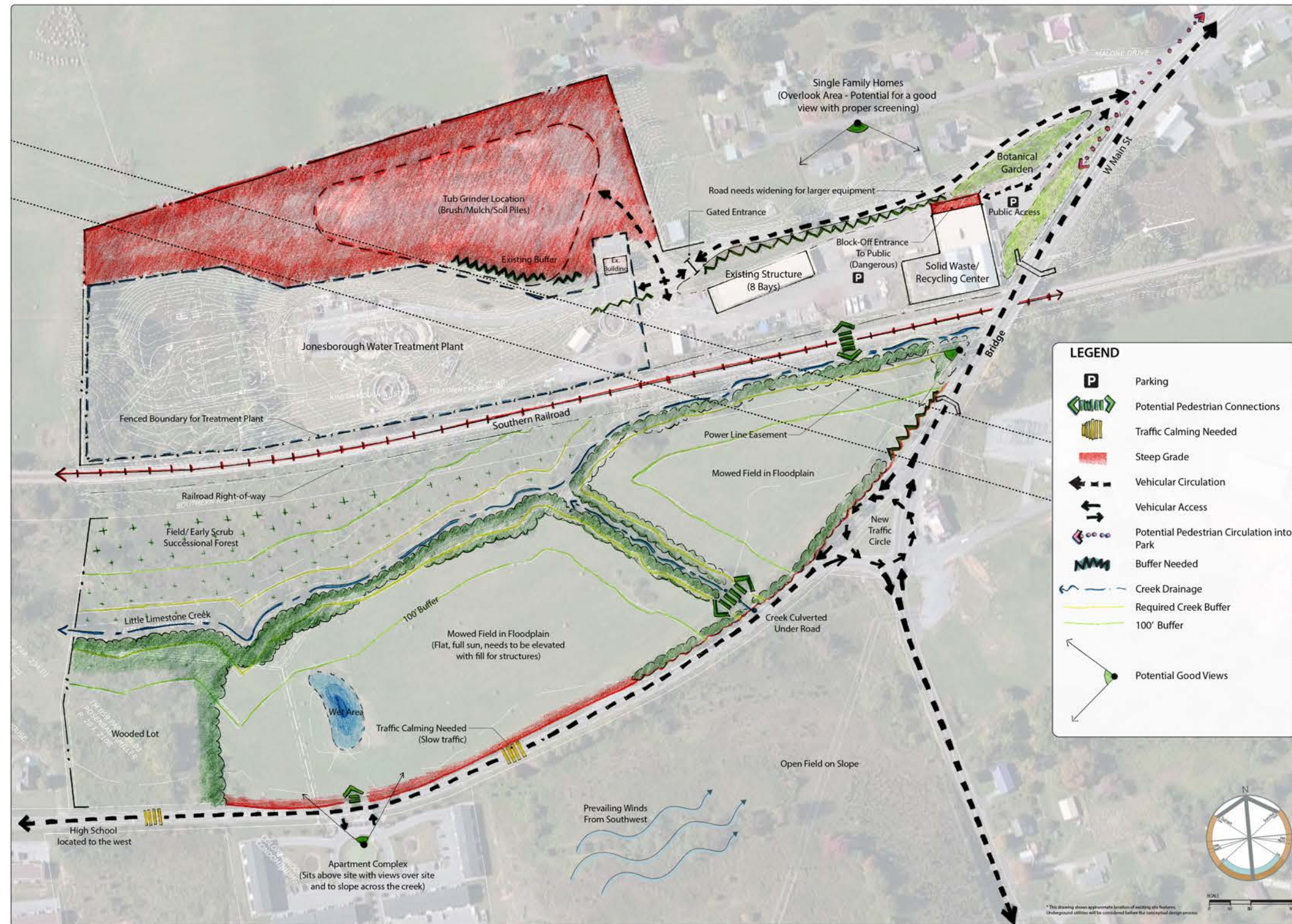
View looking North toward existing employee entrance on the upper site from the waste water treatment area.

SITE INVENTORY
Hydrology



SITE INVENTORY
Site Hydrology





MUNICIPAL GARAGE PRELIMINARY CONCEPTS

Three preliminary design concepts were developed for the municipal garage complex. The initial concepts attempted to incorporate recreational fields for the Parks and Recreation Department, but after much discussion, it was agreed upon by town staff that recreational fields would be better suited elsewhere given the site constraints and the needs of the municipal garage. The following pages outline the initial concepts provided to the stakeholders group.

MUNICIPAL GARAGE PRELIMINARY CONCEPTS

Preliminary Concept 1

Concept 1 spreads uses over both the upper and lower portions of the site with a railroad crossing preferred between the two areas. The recreational fields are on the lower portion in much of the flood plain area. The administration building of the municipal garage fronts the fields and acts as the border between the public and private functions of the site.

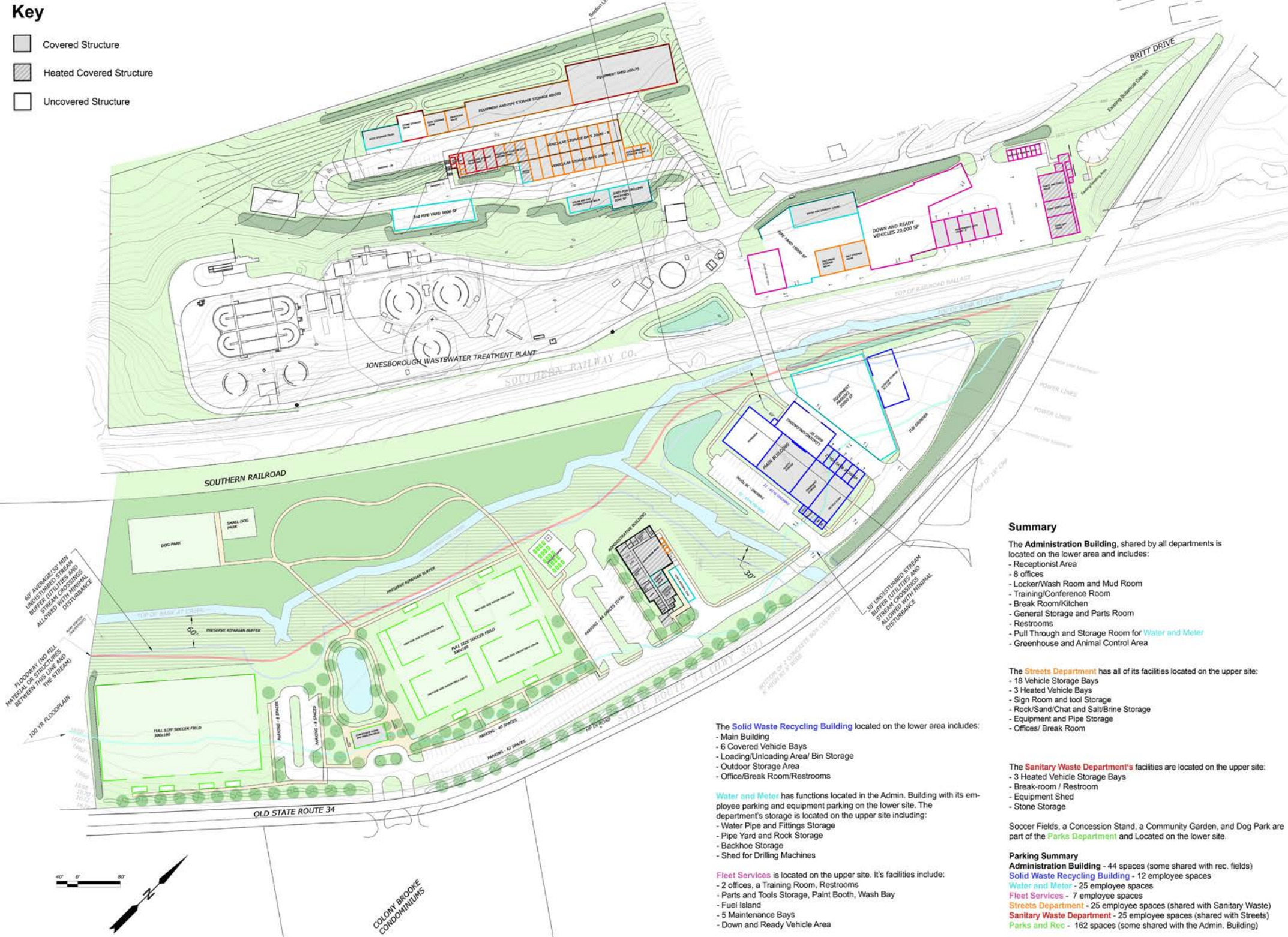
On the upper site, as you drive in from Main Street, the road splits into two driveways. The lower driveway takes you down into the botanical garden, which is adjacent to the new fleet maintenance building, but does not allow access to the municipal garage.

At the entrance to Main Street, the upper road (Britt Drive) is shared between the few residents that live on this road and various facilities department staff members. There are two entrances into the municipal garage along this drive: one that enters directly into Fleet Services and another that accesses the existing wastewater treatment plant, Street, Water and Meter, as well as Sanitary Department facilities on the hillside, and access road to the lower site. The two entrances allow for easy access to Fleet Services, but prevent daily traffic from passing through the repair area. In order to accommodate the spatial needs of every department; the hill was subdivided into two tiers with a one-way circulation pattern. Access to the different garages, offices, and storage areas are along each side of the road.

The lower site holds a large recreational area, which is accessible from Old State Route 34. Two large soccer fields that can double as eight smaller soccer fields take up a majority of the space on this site. There is enough parking spread across the site for 175 vehicles. The refreshment and restroom facility was located adjacent to an existing sanitary sewer line in order to cut costs. Adjacent to this facility is a path that leads to a loop trail across the Little Limestone Creek. Next to the Administration Building is a gated community garden with beds. The garden was located close to the parking lot for easy access.

At the of the road past the Administration Building tucked into the eastern corner of the lower site is the tub grinder and mulch pickup. The solid waste facility is also located on this area of the site but is separated by a gate to restrict public access. Riparian buffers are used to protect Little Limestone Creek from further damage.

Preliminary concept one and concept images can be found on the following pages.



- Key**
- Covered Structure
 - Heated Covered Structure
 - Uncovered Structure

Summary

The **Administration Building**, shared by all departments is located on the lower area and includes:

- Receptionist Area
- 8 offices
- Locker/Wash Room and Mud Room
- Training/Conference Room
- Break Room/Kitchen
- General Storage and Parts Room
- Restrooms
- Pull Through and Storage Room for **Water and Meter**
- Greenhouse and Animal Control Area

The **Streets Department** has all of its facilities located on the upper site:

- 18 Vehicle Storage Bays
- 3 Heated Vehicle Bays
- Sign Room and tool Storage
- Rock/Sand/Chat and Salt/Brine Storage
- Equipment and Pipe Storage
- Offices/ Break Room

The **Sanitary Waste Department's** facilities are located on the upper site:

- 3 Heated Vehicle Storage Bays
- Break-room / Restroom
- Equipment Shed
- Stone Storage

Soccer Fields, a Concession Stand, a Community Garden, and Dog Park are part of the **Parks Department** and Located on the lower site.

Parking Summary
Administration Building - 44 spaces (some shared with rec. fields)
Solid Waste Recycling Building - 12 employee spaces
Water and Meter - 25 employee spaces
Fleet Services - 7 employee spaces
Streets Department - 25 employee spaces (shared with Sanitary Waste)
Sanitary Waste Department - 25 employee spaces (shared with Streets)
Parks and Rec - 162 spaces (some shared with the Admin. Building)

The **Solid Waste Recycling Building** located on the lower area includes:

- Main Building
- 6 Covered Vehicle Bays
- Loading/Unloading Area/ Bin Storage
- Outdoor Storage Area
- Office/Break Room/Restrooms

Water and Meter has functions located in the Admin. Building with its employee parking and equipment parking on the lower site. The department's storage is located on the upper site including:

- Water Pipe and Fittings Storage
- Pipe Yard and Rock Storage
- Backhoe Storage
- Shed for Drilling Machines

Fleet Services is located on the upper site. It's facilities include:

- 2 offices, a Training Room, Restrooms
- Parts and Tools Storage, Paint Booth, Wash Bay
- Fuel Island
- 5 Maintenance Bays
- Down and Ready Vehicle Area

Possible Administrative Building Character



Storage Structure Character



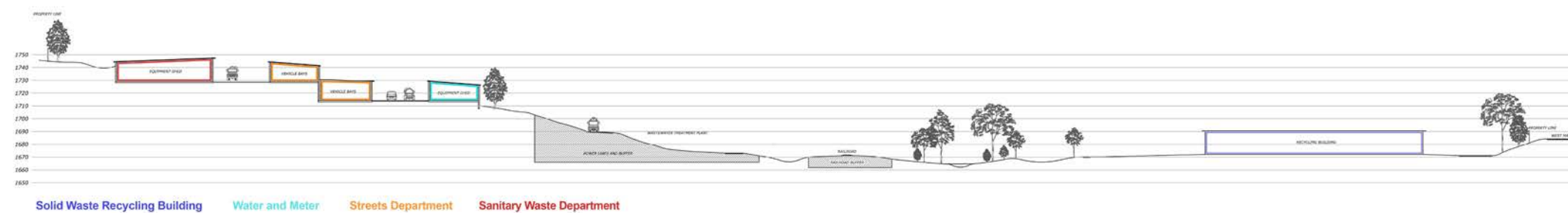
Recreation



Landscape Strategies



Section 1"=40' Scale



MUNICIPAL GARAGE PRELIMINARY CONCEPTS

Preliminary Concept 2

Concept 2 seeks to consolidate the municipal garage onto the upper site and use the lower site for recreational purposes only.

On the upper site, as you drive in from Main Street, the road splits into two. The lower route takes you down into a visitor's parking lot, which is adjacent to the Administration Building. This building holds offices for the department heads of Water, Meter, Street, and Solid Waste. If a resident wishes to drop off brush or purchase mulch, then they would continue on around the east side of the Administration Building to the rear of the Solid Waste Building. Here, visitors can stack along the edge of the employee parking lot, drop-off and/or receive their goods, and turn around to exit on the road through which they entered.

The upper road (Britt Drive) has two entrances into the municipal garage that are for employees only. The first area along this drive is for the solid waste and recycling facility. At the end of this drive, the user can continue straight towards the new Sanitary Treatment facility, turn left to the centrally located fuel island, or turn right towards the Fleet, Water and Meter, and Street Departments.

In order to accommodate the spatial needs of every department, the hill was subdivided vertically into four tiers. The upper tier is for Fleet Maintenance and their down and ready area. This was placed on the highest part of the site in order to reduce the amount of through traffic through the area. The impound lot is also placed on this level. The second tier holds the Water and Meter Department. Water, pipe, and straw storage areas are located underneath the Fleet Maintenance facility, as well as an employee parking area. Employee parking for Water and Meter, as well as the Street Department are located on the second tier. The second tier also holds the backhoe storage building, and large pipe field to the south of the storage areas, which is underneath the Fleet's down and ready area. The third tier holds the Street Department storage bays. Underneath the employee parking area on the second tier are nine vehicular storage bays with 12' ceiling clearances. Across from these bays are larger bays with 16'-20' clearances. The heated bays are included in this area, along with the animal holding area, and horticultural storage area. There is also a small rock storage area located on the third tier.

MUNICIPAL GARAGE PRELIMINARY CONCEPTS






The lower tier holds a large pipe field for the Water and Meter Department, which is partially located underneath the Street Department's storage bays. Adjacent to this area is the Salt Storage and Brining Facility, which is easily accessible from the main loop road.

Since the Solid Waste and Recycling Facility effectively doubled from its original size, the Sanitary Sewer Department needed to have three heated bays, stone storage, and equipment storage shed added for their use. The heated bays and stone storage are located behind the fuel island and adjacent to the Solid Waste and Recycling loading area. The equipment storage shed was relocated to the south of the Sanitary Treatment Facility. Since the grades are so severe in this area, the equipment storage shed needed to be subdivided into three levels.

The lower site holds a large recreational area, which is accessible from State Route 353. Two large soccer fields and four smaller soccer fields take up a majority of the space on this site. There is enough parking spread across the site for 175 vehicles. The refreshment and restroom facility was located adjacent to an existing sanitary sewer line in order to cut costs. Adjacent to this facility is a path that leads to a loop trail across the Little Limestone Creek. Next to the northernmost large soccer field is a gated community garden with 20 beds. The garden is located close to the parking lot for easy access. There is also a small driveway provided for gardeners to use. The main vehicular road continues to the north and crosses a tributary of the Little Limestone Creek into another field. This area is designated for a gated dog park. Another restroom facility is located here, since this area is some distance from the soccer fields.

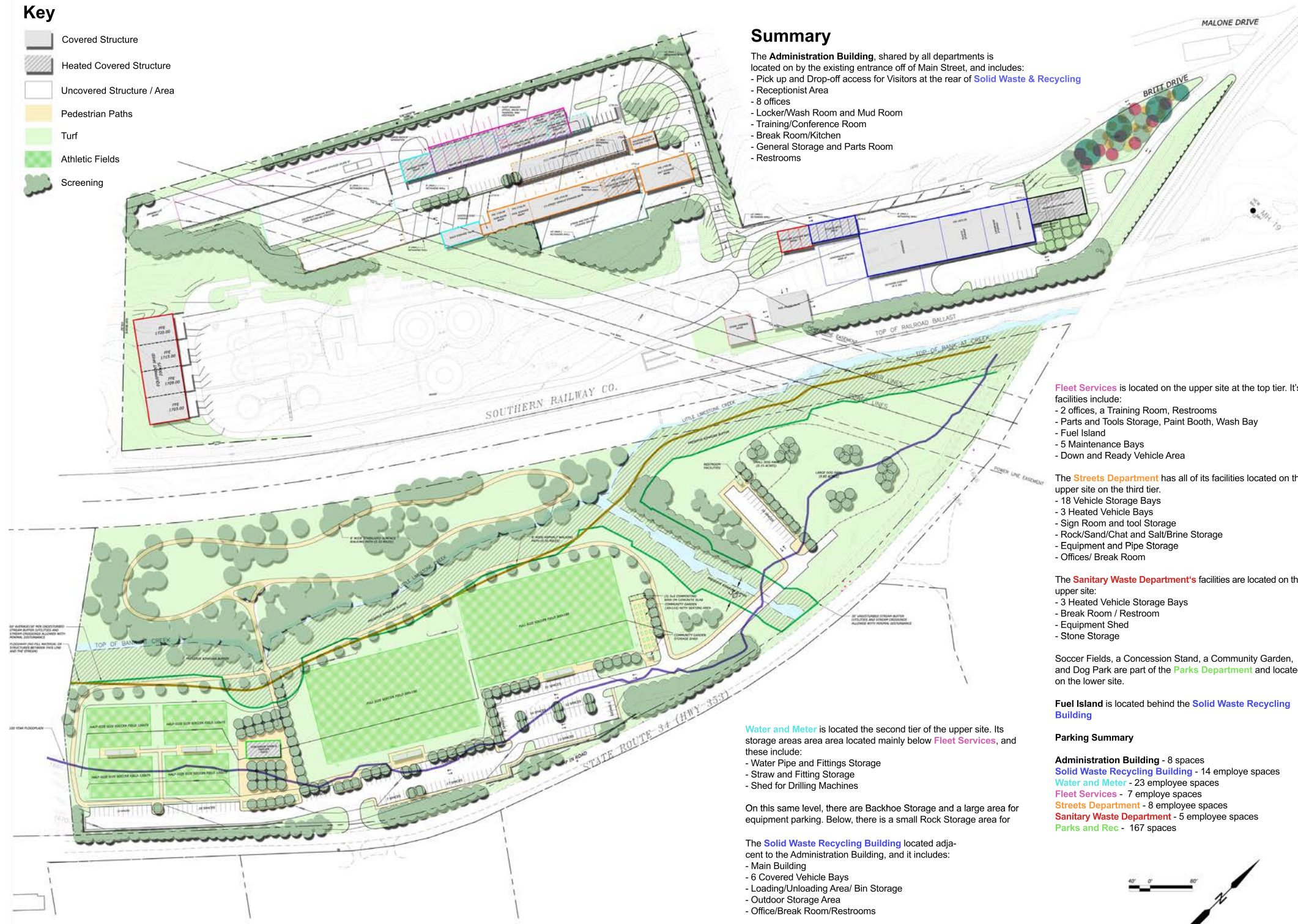
The Concept 2 master plan can be found on the following page.

Key

-  Covered Structure
-  Heated Covered Structure
-  Uncovered Structure / Area
-  Pedestrian Paths
-  Turf
-  Athletic Fields
-  Screening

Summary

- The **Administration Building**, shared by all departments is located on by the existing entrance off of Main Street, and includes:
- Pick up and Drop-off access for Visitors at the rear of **Solid Waste & Recycling**
 - Receptionist Area
 - 8 offices
 - Locker/Wash Room and Mud Room
 - Training/Conference Room
 - Break Room/Kitchen
 - General Storage and Parts Room
 - Restrooms



Fleet Services is located on the upper site at the top tier. It's facilities include:

- 2 offices, a Training Room, Restrooms
- Parts and Tools Storage, Paint Booth, Wash Bay
- Fuel Island
- 5 Maintenance Bays
- Down and Ready Vehicle Area

The **Streets Department** has all of its facilities located on the upper site on the third tier.

- 18 Vehicle Storage Bays
- 3 Heated Vehicle Bays
- Sign Room and tool Storage
- Rock/Sand/Chat and Salt/Brine Storage
- Equipment and Pipe Storage
- Offices/ Break Room

The **Sanitary Waste Department's** facilities are located on the upper site:

- 3 Heated Vehicle Storage Bays
- Break Room / Restroom
- Equipment Shed
- Stone Storage

Soccer Fields, a Concession Stand, a Community Garden, and Dog Park are part of the **Parks Department** and located on the lower site.

Fuel Island is located behind the **Solid Waste Recycling Building**

Parking Summary

- Administration Building** - 8 spaces
- Solid Waste Recycling Building** - 14 employee spaces
- Water and Meter** - 23 employee spaces
- Fleet Services** - 7 employee spaces
- Streets Department** - 8 employee spaces
- Sanitary Waste Department** - 5 employee spaces
- Parks and Rec** - 167 spaces

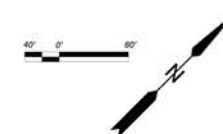
Water and Meter is located the second tier of the upper site. Its storage areas area located mainly below **Fleet Services**, and these include:

- Water Pipe and Fittings Storage
- Straw and Fitting Storage
- Shed for Drilling Machines

On this same level, there are Backhoe Storage and a large area for equipment parking. Below, there is a small Rock Storage area for

The **Solid Waste Recycling Building** located adjacent to the Administration Building, and it includes:

- Main Building
- 6 Covered Vehicle Bays
- Loading/Unloading Area/ Bin Storage
- Outdoor Storage Area
- Office/Break Room/Restrooms



MUNICIPAL GARAGE PRELIMINARY CONCEPTS

Preliminary Concept 3

Concept 3 looked at developing mostly the lower site, primarily for facilities Departmental needs, and leaving little room for recreational development.

As in Concept 2, as you enter the upper site from Main Street, the road splits into two. The lower route takes you down into a visitor's parking lot, which is adjacent to the Administration Building. This building holds offices for the department heads of Water, Meter, Street, and Solid Waste. If a resident wishes to drop off brush, or purchase mulch, then they would continue on around the east side of the Administration Building to the rear of the Solid Waste Building. Here, visitors can stack along the edge of the employee parking lot, drop-off and/or receive their goods, and turn around to exit through the road through which they entered.

The upper road (Britt Drive) has two entrances into the municipal garage that are for employees only. The first area along this drive is for the solid waste and recycling facility. At the end of this drive, the user can continue straight towards the new Sanitary Treatment facility, turn left to the centrally located fuel island, or turn right towards the Fleet Service, Water and Meter, and Street Departments. Up the hill above the centrifuge building is a large equipment shed used by the Sanitary Department. At the top of this hill is an impound lot, which is managed by the Police Department. Back at the four-way intersection, to the left are heated vehicular storage bays for both the Sanitary and Solid Waste Departments, a loading dock for the Solid Waste Department, and an area for stone storage used by the Sanitary Department. This road continues on to a proposed private railroad crossing that connects the upper and lower sites.

The lower site can be accessed from State Route 353 by using one of two entrances. The northern entrance should be used primarily by the Fleet Services Department. This was done in order to reduce cross-traffic throughout the site. Using the northern entrance, and taking an immediate right, will lead you to the Fleet Services Department. The first left on this drive will access a one-way drive that circumnavigates the Fleet campus, which consists of employee parking, a 20,000 square foot down and ready vehicle area, a large heated building containing five maintenance bays, parts and tools storage, offices, break room, training room, and restrooms. At the end of this one-way loop is a wash bay and paint booth. Taking a left back onto the main drive will lead the user back towards the railroad crossing and to the upper site.

MUNICIPAL GARAGE PRELIMINARY CONCEPTS

The southern entrance off of State Route 353 should be used primarily by the Street Department, Water and Meter Department, and the general public. Taking the first right after entering the site will put the user at a key-card operated gate. Once past this gate, they will be on a two-way loop road around various structures used by multiple departments. The first area on this two-way loop is a fuel island that can be easily accessed by all departments.






Within the campus of the loop road system lies a number of structures for the Water and Meter Department and the Street Department. One row of structures contains equipment and pipe storage for the Street Department, as well as water pipe storage and rock storage for the Water and Meter department. Offset 40 feet from this building cluster is another row of structures, which can be accessed from two sides. This series of structures includes straw and pipe fitting storage, a shed for drilling machines, and heated backhoe storage for the Water and Meter department. This series also includes three heated storage bays, nine unheated storage bays, tool storage, a sign room, and rock/sand/chat storage all for the Street Department. A final row of buildings consists, again offset 40 feet, this time from the second series of structures. This series consists of a salt storage and brining facility and nine unheated vehicular storage bays for the Street Department. This series also includes a 20,000 square foot area for large equipment parking used by the Water Department.

A considerable amount of vegetative buffering separates the southern section from the rest of the lower site. The southern section has been reserved for temporary soccer fields and future expansion for facilities. There are two parking lots, which will be used for employee parking during operational hours. After hours, these spaces can be used by the general public. As in Concept 2, there is a 1/3 mile loop trail that crosses the Little Limestone Creek. This can be accessed from the north parking lot on the west side of the lower site.

The concept three master plan and image board for both concepts two and three can be found on the following pages.

PRELIMINARY DESIGN CONCEPTS
Concept 3 Master Plan

Key

-  Covered Structure
-  Heated Covered Structure
-  Uncovered Structure / Area
-  Pedestrian Paths
-  Turf
-  Screening

Summary

The **Administration Building**, shared by all departments is located on by the existing entrance off of Main Street, and includes:
 - Pick up and Drop-off access for Visitors at the rear of **Solid Waste & Recycling**
 - Receptionist Area
 - 8 offices
 - Locker/Wash Room and Mud Room
 - Training/Conference Room
 - Break Room/Kitchen
 - General Storage and Parts Room
 - Restrooms

The **Solid Waste Recycling Building** located adjacent to the Administration Building, and it includes:
 - Main Building
 - 6 Covered Vehicle Bays
 - Loading/Unloading Area/ Bin Storage
 - Outdoor Storage Area
 - Office/Break Room/Restrooms

Water and Meter is located on the lower site, adjacent to the **Streets Department**, which include:
 - Water Pipe and Fittings Storage
 - Straw and Fitting Storage
 - Shed for Drilling Machines
 - Backhoe Storage
 - Rock Storage
 - Equipment Parking
 - Pipe Yard

Fleet Services is located on the lower site, and separated from other departments by a stream tributary and the railroad tracks. They include:
 - 2 offices, a Training Room, Restrooms
 - Parts and Tools Storage, Paint Booth, Wash Bay
 - Fuel Island
 - 5 Maintenance Bays
 - Down and Ready Vehicle Area

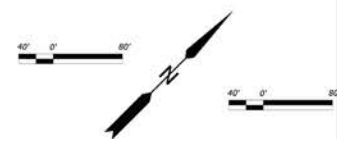
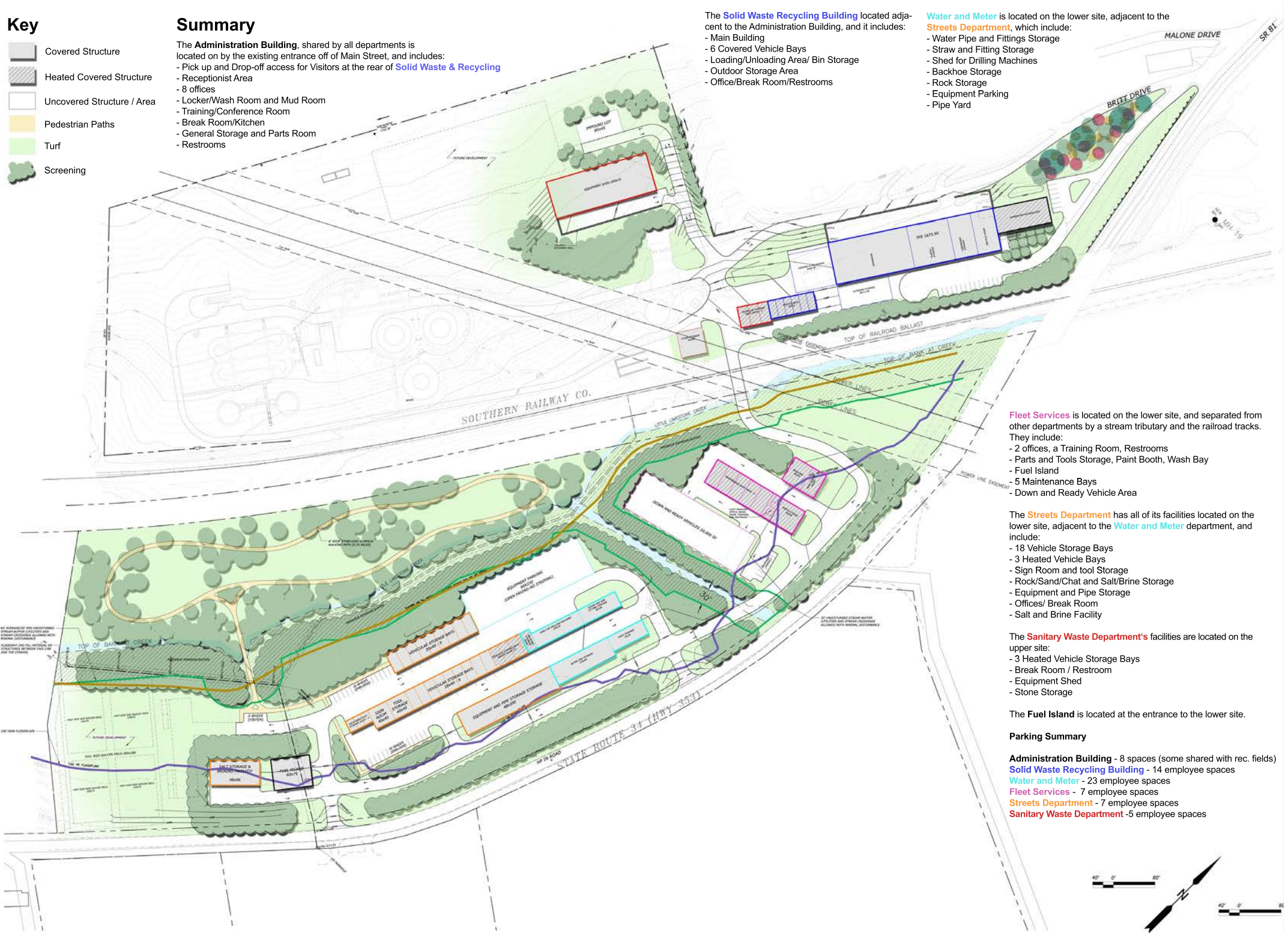
The **Streets Department** has all of its facilities located on the lower site, adjacent to the **Water and Meter** department, and include:
 - 18 Vehicle Storage Bays
 - 3 Heated Vehicle Bays
 - Sign Room and tool Storage
 - Rock/Sand/Chat and Salt/Brine Storage
 - Equipment and Pipe Storage
 - Offices/ Break Room
 - Salt and Brine Facility

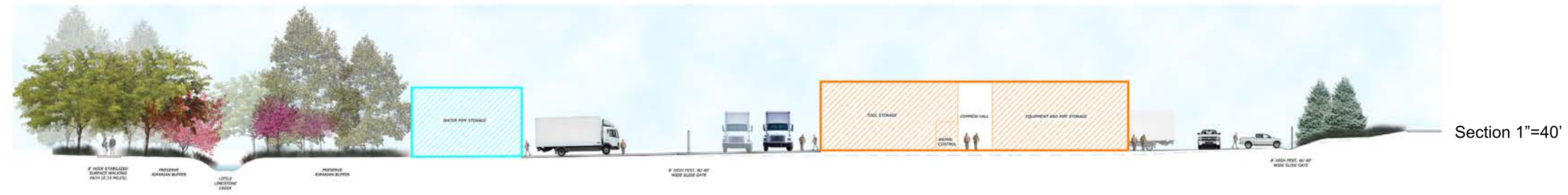
The **Sanitary Waste Department's** facilities are located on the upper site:
 - 3 Heated Vehicle Storage Bays
 - Break Room / Restroom
 - Equipment Shed
 - Stone Storage

The **Fuel Island** is located at the entrance to the lower site.

Parking Summary

- Administration Building** - 8 spaces (some shared with rec. fields)
- Solid Waste Recycling Building** - 14 employee spaces
- Water and Meter** - 23 employee spaces
- Fleet Services** - 7 employee spaces
- Streets Department** - 7 employee spaces
- Sanitary Waste Department** - 5 employee spaces





Administrative & Fleet Maintenance Building Character

A blend of Jonesborough's historic architecture and industrial architectural characteristics



Storage Building Character

Durable and affordable materials for easy access storage of materials, vehicles, and other equipment.



Landscape Strategies

Sustainable strategies, such as rainwater harvesting, permeable paving, stormwater conveyance and collection, as well as vegetative screening, are all landscape strategies that would benefit the environmental health and visual quality of the site and its surroundings.



PART 3: APPENDIX

APPENDIX

A. Soil Samples

B. Explanation of Soil Tests

C. Maintenance Needs

**APPENDIX A:
Soil Samples**



**APPENDIX A:
Soil Samples**

Name	Sample ID	LabID	pH	BpH	P ppm	K ppm	Ca ppm	Mg ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	B ppm	% OM	SS ppm	CEC meq/1	% Acidity	% Base Sat	% Ca Sat	% Mg Sat	% K Sat	P Rating	K Rating	Ca Rating	Mg Rating
JESSUP JEN MUN01		48302	5.52	6.06	6	52	718	91	3.6	12.5	0.7	32	0.3			6.5	31.1	68.9	55.3	11.5	2	L+	M	M+	H
JESSUP JEN MUN02		48303	4.71	5.58	143	247	924	109	16.8	43.2	0.8	91.5	0.3			11	44.2	55.8	41.9	8.1	5.7	VH	VH	H	VH
JESSUP JEN MUN03		48304	5.36	5.97	8	52	434	65	2.8	18	0.8	53.7	0.2			5.4	47.4	52.6	40.2	9.9	2.5	M-	M	M-	M+
JESSUP JEN MUN04		48305	5.04	5.92	3	31	366	51	1.9	9.4	0.7	36.3	0.2			5.2	55.1	44.9	35.3	8	1.5	L	L+	M-	M
JESSUP JEN MUN05		48306	5.26	5.96	3	36	365	49	1.7	9.1	0.6	29.8	0.2			4.9	53	47	36.9	8.2	1.8	L	L+	M-	M
JESSUP JEN MUN06		48307	5.33	5.99	4	39	460	70	9.1	13	0.7	27.6	0.2			5.4	45	55	42.5	10.6	1.8	L	M-	M-	M+
JESSUP JEN MUN07		48308	6.13	6.25	5	36	923	111	4.8	14.6	0.8	13.6	0.4			6.5	13.7	86.3	70.8	14.1	1.4	L+	L+	H	VH
JESSUP JEN MUN08		48309	6.59	6.42	10	239	1064	158	1.4	25.7	0.3	8.9	0.3			7.3	0.7	99.3	73	17.9	8.4	M-	VH	H+	VH
JESSUP JEN MUN09		48310	8.05	N/A	1	108	4092	409	1.8	17.2	0.1	0.9	0.3			24	N/A	100	84.9	14	1.1	L-	H	VH	VH
JESSUP JEN MUN10		48311	7.46	N/A	3	87	2646	251	2.7	28	0.5	2.4	0.5			15.5	N/A	100	85.2	13.3	1.4	L	M+	VH	VH
JESSUP JEN SEC01		48312	7.85	N/A	5	139	4646	259	22.4	15.3	0.3	0.7	1.6			25.6	N/A	100	90.3	8.3	1.4	L+	H	VH	VH
JESSUP JEN SEC02		48313	7.27	N/A	38	220	3160	212	34.5	21.1	1	2.6	1.7			18.1	N/A	100	87.2	9.7	3.1	H	VH	VH	VH

APPENDIX B: Explanation of Soil Tests

Soil Test Note #1

Virginia Cooperative Extension

PUBLICATION 452-701

Explanation of Soil Tests

Rory Maguire, *Extension Nutrient Management Specialist, Virginia Tech*
 Steve Heckendorn, *Soil Test Laboratory Manager, Virginia Tech*

The accompanying Soil Test Report (and supplemental Soil Test Notes, when provided) will help you assess your plant's need for fertilizer and lime.

The "History of Sampled Area" section restates the information you filled in on the Soil Sample Information Sheet you submitted with the soil sample.

The "Lab Test Results" section shows the relative availability of nutrients numerically and if appropriate, as a rating. The rating may be interpreted as follows: L=Low, M=Medium, H=High, VH=Very High, EH=Excessively High (soluble salt test only), DEF=Deficient, or SUFF=Sufficient, and sometimes a "+" or "-" When soils test Low, plants almost always respond to fertilizer. When soils test Medium, plants sometimes respond to fertilizer and a moderate amount of fertilizer is typically recommended to maintain fertility. When soils test High to Very High, plants usually do not respond to fertilizer. If there is no rating for a nutrient, the adequacy of that nutrient in the soil for the plant you specified has not been determined.

The following is an explanation of the symbols and abbreviation used in the report:

Report Symbols and Abbreviations

P = phosphorus	K = potassium
Ca = calcium	Mg = magnesium
Zn = zinc	Mn = manganese
Cu = copper	Fe = iron
B = boron	SS = soluble salts
lb/A = pounds per acre	ppm = parts per million
meq = milliequivalent	g = gram
pH = acidity	Sat. = saturation
N = nitrogen	P ₂ O ₅ = phosphate
K ₂ O = potash	% = percent
Est-CEC = estimated cation exchange capacity	
AG = agricultural limestone (dolomitic or calcitic)	

Fertilizer Recommendation

The fertilizer recommendations may be used for the same crop for two to three years. After this time, it is advisable to retest the soil to determine if significant changes have occurred in nutrient levels. When the soil tests Very High for phosphorus or potassium and no fertilizer for these nutrients is recommended, you should retest the following year to determine if fertilizer will be needed. Due to the variability associated with sampling, fertilizer application rates may be varied by a plus or minus 10 percent.

No soil test is performed for **nitrogen** because this element is too mobile in the soil for laboratory results to be useful. Nitrogen fertilizer recommendations are based on the crop/plant to be grown, the previous crop, and when applicable, the soil's yield potential. Comments on the report and other enclosed Notes, if any, will have further information regarding nitrogen.

Lime Recommendation

If needed, a lime recommendation is given to neutralize soil acidity and should last two to three years. After that time, you should have the soil retested. The measured soil test levels of calcium and magnesium are used to determine the appropriate type of limestone to apply. If neither dolomitic nor calcitic lime is mentioned, or "Ag" type or "agricultural" limestone is stated on the report, then it does not matter which type is used. When no information on the Soil Sample Information Sheet was provided regarding the last lime application, the lab assumed you have not applied lime in the past 18 months. If this is not correct, contact your Extension agent for advice on adjusting the lime recommendation to take into consideration recent lime applications. Do not over lime! Too much lime can be as harmful as too little. For best results, apply lime, when possible, several months ahead of the crop/plant to be planted to allow time for more complete soil reaction.

www.ext.vt.edu



Produced by Communications and Marketing, College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, 2010

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College of Architecture + Urban Studies
 Virginia Polytechnic Institute and State University

APPENDIX B: Explanation of Soil Tests

Methods and Meanings

For more detail on the lab procedures used, visit www.soiltest.vt.edu and click on “Laboratory Procedures.”

Soil pH (or soil reaction) measures the “active” acidity in the soil’s water (or hydrogen ion activity in the soil solution), which affects the availability of nutrients to plants. It is determined on a mixed suspension of 1:1, volume to volume ratio of soil material to distilled water.

Virginia soils naturally become acidic, and limestone periodically needs to be applied to neutralize some of this acidity. A slightly acid soil is where the majority of nutrients become the most available to plants, and where soil organisms that decompose organic matter and contribute to the “overall health” of soils are the most active. When a soil is strongly acidic (< 5.0-5.5), many herbicides lose effectiveness and plant growth is limited by aluminum toxicity. When soils are over-limed and become alkaline (> 7.0), micronutrients, such as manganese and zinc, become less available to plants.

For most agronomic crops and landscaping plants, lime recommendations are provided to raise the soil pH to a slightly acid level of between 5.8 and 6.8. Blueberries and acid-loving ornamentals generally prefer a 4.5 to 5.5 pH, and an application of liming material is suggested when the soil pH drops below 5.0. For the majority of other plants, lime may be suggested before the pH gets below 6.0. This is to keep the soil pH from dropping below the ideal range, since lime is slow to react and affects only a fraction of an inch of soil per year when the lime is not incorporated into the soil. If the soil pH is above the plant’s target pH, then no lime is recommended. If the pH is well above the ideal range, then sometimes an application of sulfur is recommended to help lower the pH faster; however, most of the time, one can just let the soil pH drop on its own.

A Mehlich buffer solution is used to determine the **Buffer Index** to provide an indication of the soil’s total (active + reserve) acidity and ability to resist a change in pH. This buffer measurement is the major factor in determining the amount of lime to apply. The Buffer Index starts at 6.60 and goes lower as the soil’s total acidity increases and more lime is needed to raise the soil pH. A sandy soil and a clayey soil can have the same soil pH; however, the clayey soil will have greater reserve acidity (and a lower Buffer Index) as compared to the sandy soil, and the clayey soil will require a greater quantity of lime to be applied in order to raise the soil pH the same amount as the sandy soil. A reported

Buffer Index of “N/A” means that it was not measured since the soil (water) pH was either neutral or alkaline and not acidic (soil pH \geq 7.0) and therefore requires no lime.

Nutrients that are available for plant uptake are extracted from the soil with a Mehlich 1 solution using a 1:5 vol:vol soil to extractant ratio, and are then analyzed on an ICP-AES instrument. An extractable Mehlich 1 level of phosphorus from 12 to 35 pounds per acre (lb/A) is rated as medium or optimum. A medium level of potassium is from 76 to 175 lb/A. Medium levels of calcium and magnesium are 721 to 1440 and 73 to 144 lb/A, respectively. Calcium and magnesium are normally added to the soil through the application of limestone. It is rare for very high fertility levels of P, K, Ca and Mg to cause a reduction in crop yield or plant growth. Levels of micronutrients (Zn, Mn, Cu, Fe and B) are typically present in the soil at adequate levels for plants if the soil pH is in its proper range. See Soil Test Note 4, at www.soiltest.vt.edu/stnotes, for documented micronutrient deficiencies in Virginia.

Soluble Salts (**S.Salts**) or fertilizer salts are estimated by measuring the electrical conductivity of a 1:2, vol:vol ratio of soil material to distilled water. Injury to plants may start at a soluble salts level above 844 ppm when grown in natural soil, especially under dry conditions and to germinating seeds and seedlings. Established plants will begin to look wilted and show signs related to drought. This test is used primarily for greenhouse, nursery and home garden soils where very high application rates of fertilizer may have led to an excessive buildup of soluble salts.

Soil **Organic Matter** (SOM) is the percentage by weight of the soil that consist of decomposed plant and animal residues, and is estimated by using either the weight Loss-On-Ignition (LOI method) from 150° to 360°C, or a modified Walkley-Black method. Generally, the greater the organic matter level, the better the overall soil tilth or soil quality, as nutrient and water holding capacities are greater, and improved aeration and soil structure enhance root growth. The percent of organic matter in a soil can affect the application rate of some herbicides. Soil organic matter levels from 0.5% to 2.5% are ordinary for natural, well-drained Virginia soils. A soil organic matter greater than 3% would be considered very high for a cultivated field on a farm, but can be beneficial. Due to relatively large amounts of organic materials being commonly added to gardens, the soil organic matter in garden soils can be raised into the range of 5% to 10%.

APPENDIX B: Explanation of Soil Tests

The remaining values that are reported under the “Lab Test Results” section are calculated from the previous measured values and are of little use to most growers.

Estimated Cation Exchange Capacity (**Est-CEC**) gives an indication of a soil’s ability to hold some nutrients against leaching. Natural soils in Virginia usually range in CEC from 1 to 12 meq/100g. A very sandy soil will normally have a CEC of 1 to 3 meq/100g. The CEC value will increase as the amount of clay and organic matter in the soil increases. This reported CEC is an estimation because it is calculated by summing the Mehlich 1 extractable cations (Ca + Mg + K), and the acidity estimated from the Buffer Index and converting to units commonly used for CEC. This is also an Effective CEC since it is the CEC at the current soil pH. This value can be erroneously high when the soil pH or soluble salts level is high.

The percent **Acidity** is a ratio of the amount of acid-generating cations (as measured by the Buffer Index) that occupy soil cation exchange sites to the total CEC sites. The higher this percentage, the higher the amount

of reserve acidity in the soil, and the higher the amount of acidity there will be in the soil solution and the lower the soil pH will be. A reported Acidity% of “N/A” means that a buffer index was not determined, and the acidity is probably less than 1 meq/100g and/or 5%, and the soil pH is alkaline (greater than 7.0).

The percent **Base Saturation** is the ratio of the quantity of non-acid generating cations (i.e., the exchangeable bases, Ca, Mg, and K) that occupy the cation exchange (CEC) sites.

The percent **Ca, Mg, or K Saturation** refers to the relative number of CEC sites that are occupied by that particular nutrient and is a way of evaluating for any gross nutrient imbalance.

Additional Information

For questions and more information, contact your local Virginia Cooperative Extension (VCE) office or go to www.ext.vt.edu. Contact information for your local Extension office appears on the upper left of your soil test report.

Conversion Factors

(Some Values are Approximate)

1 acre = 43,560 square feet

1 pound of 5-10-5, 5-10-10 or 10-10-10 fertilizer = 2 cups

1 pound of ground limestone or ground dolomitic limestone = 1.5 cups

1 pound of aluminum sulfate or magnesium sulfate = 2.5 cups

1 pound of sulfur = 3.3 cups

1 quart = 2 pints = 4 cups

1 pint = 2 cups = 32 tablespoons

1 tablespoon = 3 teaspoons

1 bushel = 35.24 liters = 1.25 cubic feet

Pounds per 100 square feet x 0.54 = lbs per cubic yard

100 square feet = 5 feet x 20 feet, 10 feet x 10 feet, or 2 feet x 50 feet

1,000 square feet = 50 feet x 20 feet, 10 feet x 100 feet, or 25 feet x 40 feet

Pounds per 100 square feet x 436 = pounds per acre

Pounds per 1,000 square feet x 43.6 = pounds per acre

Pounds per acre x 0.0023 = pounds per 100 square feet

Pounds per acre x 0.023 = pounds per 1,000 square feet

APPENDIX C
Maintenance Needs

Department	Item	Dimensions	Square Foot	Quantity	Total Square Foot	Notes
LOWER SITE	Receptionist Area	20'x24'	480	1	480	All departments
	Washroom / Locker Room	24'x37'	888	1	888	All departments
MAIN BUILDING	ADMINISTRATION SECTION					
	Parts Room Storage	50'x60'	3,000	1	6,000	Water + Meter Department (Close to Mike's Office) - 1st Floor
	Visitors Bathrooms	14'x21'	294	2	588	All departments
	Mud Room	14'x25'	350	1	350	All departments
	Mud Room	10'x25'	250	1	250	All departments
	Storage Room (Water pumps, safety equip)	25'x39'	975	1	975	Enclosed, inside Admin Building - Needs separate room for chemicals - 1st Floor
1st Floor	Horticulture Area	20'x28'	560	1	560	
2nd Floor	Office	12'x12'	144	3	432	Water Department
	Office	17'x25'	425	1	425	Meter Department (Shared)
	Office	15'x15'	225	1	225	Street Department (Director)
	Office	10'x15'	150	1	150	Street Department
	Office	15'x17'	255	1	255	Solid Waste / Recycling Department (Director)
	Print/Map/GIS Room	19'x25'	475	1	475	All departments
	Training / Conference Room	18'x42'	756	1	756	All departments
	Break Room / Kitchen	23'x31'	713	1	713	All departments , should be located near supervisors offices
	General Storage	20'x30'	600	1	600	All departments
	Other Bathrooms	10'x17'	170	2	340	All departments
	Cleaning Storage Closet	11'x11'	121	1	121	All departments
	SUBTOTAL				14,583	
	30% CIRCULATION				4,375	
	TOTAL				18,958	
MAIN BUILDING	DEPARTMENT STORAGE SECTION					
	Equipment & Pipe Storage	40'x200'	8,000	1	8,000	Street Department
	Tool Storage	40'x43'	1,720	1	1,720	Street Department
	Sign Room	40'x50'	2,000	1	2,000	Street Department
	Animal Control Area	8'x10'	80	3	240	Street Department
	Heated Vehicular Storage Bay	20'x40'	800	3	2,400	Street Department
	Vehicular Storage Bay	20'x40'	800	18	14,400	Street Department
	Heated Vehicular Storage Bay	20'x40'	800	7	5,600	Water Department
	30' Wide Drive Lane	30'x340'	10,200	1	10,200	All Departments
	12.5' Wide Common Hall	12.5'x80'	1,000	1	1,000	All Departments
	TOTAL				45,560	
STREETS	Rock / Sand / Chat Storage Area	16'x24'	384	3	1,152	Covered
8 Employees	Salt Storage	48'x96'	4,608	1	4,608	Enclosed, wood structure, upwind from vehicles, room for future salt brining facility indoors and area for loader to gather material and turn around
	Salt Brining Barrels (cylinder)	8' diameter	50	1	50	Barrel sits on either a gravel or concrete pad (10'x10') with drain connected to sanitary sewer
	TOTAL				5,810	
WATER + METER	Water Pipe (PVC, DIP, etc.)	125'x40'	5,000	1		WITHIN PIPE YARD: Covered, Needs concrete pad, Enclosed
18 Employees (water)	Straw and Water Pipe Fittings Storage	80'x30'	2,400	1		WITHIN PIPE YARD: Enclosed, back & sides
5 Employees (meter)	Pipe Yard (Covered Shed)	150'x150'	22,500	1	22,500	Area with Straw and Water Pipe Fitting Storage & Water Pipe (PVC, DIP, etc.) - Covered Concrete Pad
	Storage Area for Parts	10'x10'	100	1	100	Covered
	Tool Storage	20'x20'	400	1	400	Covered
	Miscellaneous Storage	30'x30'	900	7	900	Covered
	Rock Storage	75'x30'x10'	2,250	1	2,250	Covered
	Shed for Drilling Machines, Etc.	100'x30'	3,000	1	3,000	Covered
	Pull Through	15'x70'	1,050	1	1,050	Covered - Large enough for tractor trailer, pull through
	Employee Parking	9'x20'	180	25	4,500	Can some of these be included in Admin building parking calcs?
	Equipment Parking	80'x250'	20,000	31	620,000	Needs to be an area - NOT STRIPED
	TOTAL				654,700	
FLEET	Maintenance Bays	25'x50'	1,250	5	6,250	Enclosed, climate controlled
4-6 Employees	Office	15'x15'	225	1	225	Directors Office
	Office	15'x10'	150	1	150	
	Library and Training	15'x10'	150	1	150	
	Bathroom	8'x10'	80	1	80	
	Paint Booth	30'x50'	1,500	1	1,500	Enclosed, ventilated TBD
	Parts and Tools	50'x50'	2,500	1	2,500	Enclosed, Mezzanine Storage
	Down & Ready Vehicles	TBD	20,000	1	20,000	Open area near facilities building
	Employee Parking	9'x20'	180	7	1,260	
	Large Backup Generator	10'x10'	100	1	100	Concrete pad - large generator at office complex and garage
	TOTAL				32,215	

GENERAL
Not Department Specific or Unsure of Department Affiliation

Fuel Island	60'x75'	4,500	1	4,500	Lighted, Covered
Fuel Storage	40'x75'	3,000	1	3,000	Covered?
Wash Bay	40'x50'	2,000	1	2,000	Enclosed, catwalk, drain underneath
Large Backup Generator	10'x10'	100	1	100	Concrete pad - large generator at office complex and garage
TOTAL				9,600	

UPPER SITE

SANITARY WASTE
12-14 Employees

Contingent on if another department takes space currently provided for the Sanitary Waste Department

Vehicular Storage Bays	20'x40'	800	3	2,400	Enclosed, heated - Electrical outlet outside
Bathroom	8'x10'	80	1	80	Enclosed
Breakroom / Kitchen	10'x15'	150	1	150	Enclosed
Equipment Shed	75'x200'	15,000	1	15,000	Covered
Stone Storage	50'x50'	2,500	1	2,500	
TOTAL				20,130	

SOLID WASTE + RECYCLING

Main Building	324'x82'	26,568	1	26,568	Design for at least double the size of original building, 25' high
Vehicle Bays	35'x12'	420	6	2,520	Covered and minimally heated, concrete floor
Loading and Unloading	72'x82'	5904	2	11,808	Dock area should be at least 12' wide
Garbage and Recycling Bin Storage	10'x12'	120	1	120	
Outdoor Storage Area	50'x100'	5,000	1	5,000	OPEN - Leaves, Compost, Mulch - Should be near Tub Grinder - concrete floor with jersey walls separating
Office	15'x15'	225	1	225	in main building
Parking Spaces	9'x18'	162	12	1,944	
Small Backup Generator	6'x6'	36	1	36	Concrete pad - smaller generators placed outside heated storage space
TOTAL				48,221	

POLICE DEPARTMENT

Impoundment lot	85' x 45'	3,825	1	3,825	
TOTAL				3,825	

General Considerations

Restrict public to front
How does the design function during an emergency response- snow, clear access, clear path
Where are the majority of vehicles in relationship to fuel
Note: Gary wants to be near vehicles- he says that they are easier to maintain this way
Considerations of solar orientation and rain harvesting- natural lighting & solar panels
Consideration of prevailing winds
Does facility accommodate large turning radii- look up turning radius of largest vehicle
Is there a potential for an educational component with recycling?
Are there public restrooms- separate from staff
What is the visual impact on the neighborhood

Departments that a better suited for public face
Recycling & Mulch
Parks and Recreation

Things that need to connected to sewer system
Wash bays
Salt

Note:12/4 notes state that the operations manager does not want to see much pick up near recreation fields and administrative parking area because will be hassle to keep area clean