

**Improvement Alternative Study**  
**for**  
**Town of New Scotland Highway Garage**  
Town of New Scotland  
Albany County  
State of New York

November 23, 2011

Revision A – Issued to Client

Site Address: 2869 New Scotland Road  
Voorheesville, NY 12186

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**HIGHWAY GARAGE FACILITY IMPROVEMENT STUDY  
CONCEPTUAL PHASE  
for  
TOWN OF NEW SCOTLAND, ALBANY COUNTY**

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## 1.0 INTRODUCTION

### 1.1 Background:

The existing highway garage facility located at 2869 New Scotland Road in New Salem was originally constructed in the 1960's. Since this time, significant population growth in the Town of New Scotland has increased the demand and scope of highway department services. The expansion of these services have included maintenance of miles of additional town roadways and growing responsibilities for storm water management in response to state and federal mandates. Within the last 10 years, the highway garage facility has also become the primary center for operating and maintaining all of the town water and sewer systems, including the housing of computer systems to continuously monitor system operations. The existing garage facility has multiple deficiencies due to its age and limited size and is considered inadequate to efficiently respond to the increased demand for highway department services.

In response to these conditions, the Town of New Scotland has requested that Stantec prepare a highway garage facility improvement study to determine options to efficiently meet the increasing demands for highway department services while maintaining operations at the existing site.

### 1.2 Goals of the Study – Conceptual Phase

The following goals were established for the conceptual phase of the Highway Garage Facility Improvement Study:

1. Identify current deficiencies in the condition and functional utility of the site.
2. Quantify space needs for operations at the highway garage facility through the year 2025.
3. Present two (2) conceptual alternatives that accommodate space and utility needs while maintaining operations at the existing site:
  - Alternative 1: Rehabilitation of the existing highway garage structure with a new administrative addition on existing site.*
  - Alternative 2: Construction of new highway garage structure on generic site to be determined.*
4. Identify costs and feasibility associated with each alternative.



## 2.0 EXISTING FACILITY CONDITIONS

### 2.1 Summary of Findings:

The site, located at 2869 New Scotland Road, is approximately 8 acres. Three structures are on the site: the 9,660 square foot, 1 story open framed vehicle storage garage building with adjacent 1,550 square foot administrative/support space; the 4,500 square foot, 1 story pole barn storage building; and the 4,000 square foot salt storage dome structure.

The facility functions as the center of operations for both Highway Department and the Department of Public Works (supervision, crew areas, repair and maintenance functions, equipment and material storage). The building also houses computer systems to actively monitor water services. The building was originally constructed in 1966.

Site visits, reviews of previous reports, and interviews of Highway Department personnel were performed to determine operational efficiency and assess the condition of the existing building. The following is a summary list of findings. Those findings which are positive are marked with a (+) and those findings which are negative are marked with a (-):

#### Site

1. (+) The existing 8 acre site is large enough to support an expansion of the building and other associated improvements as required.
2. (-) The existing water supply consists of a groundwater well located approximately 15 feet of the east side of the building. Analysis of the water quality indicates elevated chloride and hardness levels which are undesirable for consumption and general use without mitigation.
3. (-) The existing septic system has not failed with current facility demands, however it appears the leach field is located underneath the existing asphalt pavement / gravel drive where it is subject to vehicular loading and does not allow for vegetation to assist in the sewage treatment process.
4. (-) The existing electric service is undersized for the existing facility size and type. Existing service supplied is Single Phase – 200 amps. Three Phase service is strongly recommended.
5. (-) Floor drains discharge to an onsite storm sewer collection system which discharges directly to a ditch along NYS Route 85A. This condition does not meet current environmental standards. In the event of an environmental spill, contaminants (oil, gasoline, solvents) would discharge directly to the roadway with very high clean-up costs. An oil/water/sediment separator tank and filter should be installed to meet current standards for a vehicle storage garage facility.

#### Highway Garage Building

1. (-) There is a lack of space for administrative functions within the existing highway garage building. Administrative functions for the Highway Department and the Department of Public Works are generally performed at the Town Hall facility. The arrangement of having administrative and supervisory functions on separate sites precludes potential efficiencies for these operations to share common resources.

2. (-) There is inadequate space in the garage area for efficient storage, outfitting, and staging of existing trucks and equipment. During the winter season, trucks are parked bumper to bumper with dangerously inadequate access between vehicles and little to no space for truck maintenance and repair functions.



3. (-) There is no defined separation between areas for equipment repair and equipment washing and common areas of travel within the garage space. Welding operations are not easily protected and commonly occur directly adjacent to areas of common travel near administrative areas of the building.
4. (-) Facilities for field personnel are inadequate. The original employee locker room has been closed off and the area converted to parts storage for the Department of Public Works. The employee lockers are spread between a common breakroom area and the main garage space. There is little privacy for employees to change their clothes and the locker storage area environment is generally dirty and dusty. There are no shower facilities within the building for Highway Department or Public Works personnel to safely wash after returning from field operations.



5. (-) Framing bay spacing is inadequate to safely and efficiently drive a truck with plow through overhead doorways. A number of perimeter columns have been impacted.



6. (-) There is inadequate fresh air make-up throughout the highway garage building. Heating units for both the garage and administrative spaces recirculate potentially contaminated air (gasoline, solvents, vehicle exhaust) from the garage space, creating an unhealthy working environment and threatening the operation and preservation of critical electrical equipment for the SCADA system and administrative staff. There is no mechanical means of air exhaust within the garage area to eliminate fumes and dangerous air pollutants in the case of an emergency spill.
7. (-) The original office exit doorway at the southeast end of the building was closed off, creating a violation of the Building Code of New York State. In the case of a fire, office personnel would have to exit through an interior door and continue through the main garage space, which is rated as a higher fire hazard. An egress path directly to the exterior from office spaces should be further considered.
8. (-) There is inadequate fire separation between the administrative space and vehicle garage area. The wall separating these areas should have properly labeled fire doors with closers and wall fire stopping should seal all penetrations.



9. (-) The garage and administrative office area are typically constructed with concrete masonry block exterior walls. These walls are not insulated and window opening are of single-pane glass. In the winter season, the office and adjacent rooms are reportedly cold and heating the highway garage is building is inefficient. Proper insulation of walls and the installation of insulated glass windows would be expected to reduce energy use for the facility by 30% and increase employee working conditions.



10. (-) Floor drains reportedly do not function properly and should be replaced by a new floor drainage system that can be easily cleaned and maintained.



11. (-) The northwest corner of the garage is enclosed and is used for the storage of gasoline, used oil, and various solvents. The fire load in this area is high and no systems are in place for grounding or fire suppression. This area needs to be fitted with a proper fire protection system, fire rated walls and containment as per requirements of the Building Code of New York State.





- 12. (-) The highway garage is required to have a fire alarm detection system to meet the Building Code of New York State. A properly designed system would provide safety for the building and occupants during active working hours, notify the New Salem Fire Company of an alarm and provide surveillance when the building is not occupied.
- 13. (-) Supervisory office space within the highway garage is inadequate. The Highway Superintendent, Water System Operator, Highway Foreman, and Office Clerk all share a one room office. There is limited privacy for personnel matters and limited opportunity for employees to discuss confidential issues with their supervisor.



- 14. (-) There is inadequate storage room for important records and blue prints and limited area to efficiently review these records. There is a need for a clean and controlled environment for storage of these documents and a defined table area for drawing and document review.
- 15. (+) The steel structure and concrete slab on grade are in relatively good condition and could be re-used without major rehabilitation.



**3.0 PROGRAMMING OF SPACE NEEDS**

**3.1 Program Summary**

The current and future space requirements for the Town of New Scotland’s Highway Department and Department of Public Works operations far exceed the space provided by the current facilities.

	<u>Total Space Required</u>	<u>Existing Space Available</u>
2015	15,025 square feet	11,175 square feet
2025	22,000 square feet	
<hr/>		
	<u>Administration Space Required</u>	<u>Existing Space Available</u>
2015	1,100 square feet	0 square feet (separate building)
2025	1,725 square feet	
<hr/>		
	<u>Crew Space Required</u>	<u>Existing Space Available</u>
2015	950 square feet	550 square feet
2025	1,050 square feet	
<hr/>		
	<u>Monitoring System Space Required</u>	<u>Existing Space Available</u>
2015	80 square feet	100 square feet
2025	90 square feet	
<hr/>		
	<u>Equipment Maintenance Space Required</u>	<u>Existing Space Available</u>
2015	3,500 square feet	1,600 square feet
2025	4,400 square feet	
<hr/>		
	<u>Equipment Storage Space Required</u>	<u>Existing Space Available</u>
2015	7,500 square feet	6,000 square feet
2025	11,650 square feet	
<hr/>		
	<u>Parts/General Storage Space Required</u>	<u>Existing Space Available</u>
2015	1,800 square feet	1,800 square feet
2025	2,500 square feet	
<hr/>		
	<u>Auto Fluid Storage Space Required</u>	<u>Existing Space Available</u>
2015	270 square feet	160 square feet
2025	225 square feet	
<hr/>		
	<u>Sign Shop Space Required</u>	<u>Existing Space Available</u>
2015	580 square feet	400 square feet
2025	775 square feet	
<hr/>		
	<u>Animal Control Space Required</u>	<u>Existing Space Available</u>
2015	125 square feet	100 square feet
2025	180 square feet	
<hr/>		
	<u>Recycling Space Required</u>	<u>Existing Space Available</u>
2015	125 square feet	60 square feet
2025	150 square feet	
<hr/>		
	<u>Utility/Mechanical Space Required</u>	<u>Existing Space Available</u>
2015	550 square feet	220 square feet
2025	425 square feet	



## 4.0 RECOMMENDATIONS

### 4.1 Overview

The existing highway garage facility is dated and does not provide adequate space for efficient and safe operation of the Highway Department and Department of Public Works functions. A number of existing conditions do not meet Building Code of New York State requirements and negatively impact the working environment within the building. Additional space must be provided and existing conditions brought into code compliance to properly support the Town's operations at this facility.

To cost effectively establish a physical plant which would enhance the Town of New Scotland's ability to provide quality service in an efficient manner for the foreseeable future, the following alternatives were developed:

Alternative 1 – Rehabilitation and expansion of the existing highway garage structure addition on the existing site.

Alternative 2 – Construction of new highway garage structure on generic site to be determined.

### 4.2 Alternative Option 1

Alternative 1 involves the demolition of the existing administrative space at the east face of the building, and addition of an enlarged one-story administrative space to the north end of the building footprint.

Existing Space Available

*11,175 square feet*

Alternative Option 1

*15,025 square feet*

Alternative 1 would add sufficient space to the highway garage building to efficiently meet all current and projected space requirements through 2015. Deficiencies in the existing site and building conditions would generally be upgraded as follows:

1. Expanded administrative space would allow all highway department and public works department administrative and supervisory functions to be located at one facility.
2. Expanded garage area would allow more efficient storage, outfitting, and staging of existing trucks and equipment. The additional area would also allow for safer spacing of parked vehicles with adequate access around all parked vehicles
3. Expanded administrative and support space would include adequate facilities for field personnel. These facilities would include private locker room space and shower facilities.
4. Expanded administrative space would include private office space for supervisory personnel.
5. Expanded administrative space would include defined storage space for records and blue prints and adequate table space for review of these documents.
6. Demolition of existing administrative space and reconfiguration of overhead doors and vehicle travel within the garage area would provide adequate door widths and space between columns for safe and efficient truck travel.
7. Existing condition deficiencies and safety issues would be upgraded and modified to meet current requirements of the Building Code of New York State.



Alternative Option 1 could be constructed in phases to allow for continued operation of the existing facility:

- Phase 1 - Construction of one-story, 5,400 sq. ft. administrative/support space addition to the north of the existing highway garage structure, including all associated site improvements, modifications and utility connections.
- Phase 2A – Demolition and removal of 1,550 sq. ft. of existing support space along the east face of garage structure.
- Phase 2B – Full renovation and modification of the existing heated vehicle storage area to provide for truck access from the east.

Conceptual estimates based on the information provided in this report; indicate the total construction cost for Alternative 1 to be in the \$2.0 - \$2.5 million range.

### **4.3 Alternative Option 2**

Alternative Option 2 involves the construction of a new highway garage facility on an appropriate site. This site location could include the existing site or new property to be determined.

Existing Space Available

11,175 square feet

Alternative Option 2

22,000 square feet

Alternative Option 2 would provide sufficient space to the highway garage building to efficiently meet all current and projected space requirements through 2025. The building would be constructed to meet all requirements of the Building Code of New York State and other applicable codes and standards.

Conceptual estimates based on the information provided in this report; indicate the building construction costs for Alternative 2 to be in the \$4.0 - \$4.5 million range. However, this price excludes several additional, necessary costs, including but not limited to: acquisition of property, utility or infrastructure extension to serve the facility's needs, general site development costs and other permitting considerations such as stormwater management and SPDES discharge requirements for the floor drain discharge.

**APPENDIX A**  
**EXISTING HIGHWAY GARAGE FACILITY ASSESSMENT**

**HIGHWAY GARAGE FACILITY - SITE**

The site, located at 2869 New Scotland Road, is approximately 8 acres in size. The site borders residential property to the North, vacant land to the West and South, and New Scotland Road to the East. Portions of the site to the South, West and East are unusable due to steep slopes. The site currently contains three structures:

1. 9,660 square foot, 1 story main garage building with a 1,550 square foot administrative space;
2. 4,000 square foot salt storage dome;
3. 4,500 square foot pole barn storage shed.

While not specifically marked or designated, approximately 10 to 15 parking spaces are available for employees and visitors. These spaces are located on the asphalt pavement at the Southeast corner of the building and adjacent to the salt storage dome.

Asphalt pavement exists at the entrance driveway and encompasses the entire garage building and salt storage dome. The remaining yard consists of gravel circulation lanes providing access to the shed building and lay down storage areas (for snow plows, concrete manholes and catch basins, piping, stone and gravel stock piles, etc.).

A fuel dispensing island is located at the Northeast corner of the building with pumps for both Diesel fuel and Gasoline. Storage tanks are buried underground in this area as well.

Site Features:

1. *Paving and Curbs*
  - a. Asphalt pavement encompasses the entire garage building while also extending to the salt storage dome. Remainder of the site consists of crushed stone gravel surface course.
  - b. General Condition: Asphalt pavement is in poor condition throughout the site. Pavement is alligator cracked and deteriorated in numerous locations. Pavement and subbase appear to be insufficiently designed for the required traffic loads.



## 2. Lawns and Landscaping

- a. A lawn area exists along the slope on the eastern portion of site, bounded by New Scotland Road. There are a row of hedges along the boundary of the garage addition as well as a small hardwood tree at the Southwest corner of the building. The remainder of the developed area is bounded by heavy vegetation and forested land.
- b. General Condition: Existing hardwood tree is in good condition. Existing hedges are in moderate condition and in need of maintenance.



## 3. Sidewalks and Walkways

- a. There two small concrete sidewalks onsite, one each at the North and South walls of the 1,500 s.f. garage addition. Each sidewalk provides ingress/egress from the asphalt pavement to the pedestrian doors entering the addition structure.
- b. General Condition: The sidewalks appear to be in good condition with minimal surface wear or deterioration and minimal differential settlement or frost heave.

## 4. Well

- a. The well is located approximately 15 feet off the east side of the building at its midpoint. Depth and construction of the well is unknown.
- b. General Condition: Capacity of the well appears to be sufficient for current use. A grab sample taken from the water supply indicates elevated hardness levels and chloride levels. Softening system exists inside the building to treat hardness. Chlorides are not treated at this time. Well water is currently utilized for non-potable purposes only.

5. *Retaining Wall Structures*

- a. An approximately 75 lf, segmental block retaining wall exists along the pavement edge spanning from the Southwest corner of the building to the salt storage dome. The wall consists of precast concrete block approximately 2' high by 2' deep by 5' long.
- b. General Condition: The retaining wall blocks are in good condition however the wall has failed and has a visible inward lean.



6. *Electric Service*

- a. Power is supplied to the site from a pole located on Thacher Park Road (NYS Route 157). The single phase service stretches west to east from Thacher Park Road to a pole located onsite, just north of the pole barn storage shed. A ground mounted transformer is located in the grass island just north of the garage building. Electrical meters are located at both the garage as well as the pole barn storage shed.
- b. General Condition: Power supply is inadequate for the facilities current and future demand.



7. *Septic System*

- a. The septic system is located just off the North side of the garage building. The septic tank and distribution box are located in the grass island north of the garage building and near and/or adjacent to the existing boulders in this area. The distribution laterals appear to be located under the existing asphalt pavement off the Northeast corner of the garage building.
- b. General Condition: Capacity of the septic system has not been tested and is unknown at this time. Exact location and actual length and quantity of the distribution laterals are unknown. While there has been no report of failure or backup, the system if located under the asphalt pavement cannot properly leach and may be causing failure of the asphalt pavement due to saturated soil conditions under the pavement.

8. *Communications / SCADA*

- a. The monitoring systems room contains the existing SCADA system. The SCADA system consists of a control panel that converts radio signal into useful data packets. The control panel is connected to a desktop computer and printer. The radio system includes cabling that extends to a radio antenna currently located on the roof of the building.
- b. General Condition: It is anticipated that all of the town’s SCADA system components will be upgraded and centralized at the highway garage at some point in the near future. The amount of space currently provided is likely adequate to support this upgrade and centralization. However, the existing room is subject to dust and contaminated air from the garage area which is damaging to the equipment. The air quality should be improved to prevent damage to the equipment and subsequent operational failure of the town’s infrastructure.





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## HIGHWAY GARAGE FACILITY - BUILDING

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The existing highway garage building consists of a 9,600 square foot, one story open framed garage with an adjacent 1,550 square foot, one story administrative space. The garage structure is constructed of double-span sloped steel frames and consists of five framing bays with a center row of columns. The administrative space is constructed of concrete masonry block and is located directly adjacent to the eastern-most bay of the open garage structure. The building was originally constructed in 1966.

The 9,600 square foot garage space consists of 1 drive-thru bay for vehicle maintenance, 2 full drive thru bays and 2 partial bays for vehicle and steel material storage and recycling space, and 1,200 square feet of enclosed area in the northeast corner of the structure used for storage of tools, tires, gasoline containers and miscellaneous low hazard materials. There is a 610 square foot mezzanine area over portions of the enclosed storage area, used for sign shop space and additional storage. The garage has a gable type roof constructed of built-up roofing over metal deck with a pitch of 1" per foot. The roof is roughly 21'-0" at its center ridge and 16'-6" at the north and south eaves. The garage is accessible through five (5) overhead doors and one man door on both the north and south ends of the structure and two additional man doors at each corner of the west end.

The 1,550 square foot administrative space is used for offices, small parts storage, employee locker room and break space, lavatories, water system monitoring equipment (SCADA), and mechanical space. The structure has a gable type roof constructed of built up roofing over metal deck with a pitch of 1" per foot. The roof is roughly 12'-0" high at its center and 9'-0" high at the eaves. The space is accessible through a series of doors into the adjacent garage area and one man door on the east side of the structure which opens into the mechanical space.

The following descriptions identify the major building systems, their features and deficiencies. These descriptions are not intended to provide a detailed analysis of the complete system but rather to provide an overview of the particular system.

### Building Architectural Systems:

#### 1. Type Construction Classification

- a. Type 2B non combustible
  - a. Raised sign shop
    - Floor and stair are constructed of combustible materials, not complying with original code requirements. Perhaps the Building Department at the time of construction determined these areas adequate.
  - b. Maximum allowable fire area 12,000 square feet based on tabulated C4.2 value without increase; actual 11,175 square feet

#### 2. Building Occupancy Classification

- a. Group C1 Business; Group C4.2 Storage (moderate hazard);

#### 3. Exiting (Maximum Distance of Travel)

- a. Allowable 100 feet
- b. Actual – exiting from the sign shop exceeds original code requirements



4. *Exiting Sign Shop (Mezzanine)*
  - a. Unenclosed stair exiting through vehicle storage bays
5. *Exiting (General Office)*
  - a. The exit through the Vehicle Storage Bays is not permitted by Code
    - Not complying with original code requirements. Perhaps the Building Department at the time of construction determined these areas adequate.
6. *Exiting (Vehicle Storage Bays)*
  - a. Three exit doors to the exterior provided
7. *Windows*
  - a. Original - working
    - Undesirable thermal value
8. *Doors*
  - a. Original - working
    - Interior – hollow metal hardware in some cases appear to be removed or not operating correctly
    - Exterior – unable to verify thermal properties of doors.
    - Fire separation – unable to verify ratings
9. *Overhead Doors*
  - a. Reasonable condition
    - Appear to be insulated
      - Unable to verify thermal properties
10. *Interior Masonry Walls*
  - a. Reasonable condition
11. *Exterior walls*
  - a. Brick and masonry cavity wall
    - Reasonable condition
      - Poor thermal value
  - b. Masonry wall
    - Reasonable condition
      - Poor thermal value
  - c. Metal support structure
    - Reasonable condition
      - Asbestos containing insulation board
12. *Roof*
  - Built-up roof with ½" rigid roof insulation
    - Reasonable condition
    - Poor thermal value



Building Structural Systems:

1. The open garage space is constructed of a series of five (5) double-span sloped steel frames. These frames span north-south between perimeter columns and central row of interior columns. Frames are spaced at 15'-0" on center and support 8" purlins and metal decking. The east and west ends of the garage space are framed with columns at 18'-0" on center, which brace concrete masonry unit walls.
2. The administrative space is constructed of 8" purlins and metal decking spanning east-west between load bearing concrete masonry unit walls.
3. The mezzanine space located at the northeast corner of the garage structure is constructed of 8" structural steel joists supported by load bearing concrete masonry unit walls.
4. The floor of both the garage and administrative spaces is concrete slab-on-grade and generally pitches to interior floor drains.
5. The building structure is in generally good condition with no major signs of overstress or apparent settlement. The following deficient items were noted:
  - a. Multiple perimeter columns in the garage space show signs of plow impacts and should be repaired and stiffened.
  - b. Concrete slab on grade has minor surface scaling, isolated minor settlement, and minor shrinkage cracking.
  - c. Floor drains do not appear to be functioning effectively and should be repaired or replaced.

Building Plumbing Systems:

1. Well is located at east end of the site. 1 1/2" water service enters the building in the utility/mechanical room and is treated with a softener system. The piping appears to be copper and in good condition. The softener treatment system appears to be inadequately maintained. A grab sample taken from the water supply indicates elevated hardness and chloride levels.
2. The septic system is located just off the North side of the garage building. The septic tank and distribution box are located in the grass island north of the garage building and near and/or adjacent to the existing boulders in this area. The distribution laterals appear to be located under the existing asphalt pavement off the Northeast corner of the garage building. Refer to the Site Features section above for additional information.
3. The domestic water heater is located in the utility/mechanical room and consists of a 32-gallon oil fired unit.
4. There is an internal gutter system with six (6) internal roof drains in the garage space and two (2) internal roof drains in the administrative space.
5. There are four (4) floor drains and one (1) cleanout located in the vehicle storage area. All but one of these drains are reportedly dysfunctional. Drain lines appear to run out of the east side of the building and tie into the storm drainage system. No oil/water/sediment separator was observed.
6. There is a men's toilet room directly adjacent to the breakroom, used mainly by highway maintenance staff. A shared men/women toilet room is located adjacent to the office area. The building contains the following plumbing features:



Watercloset		Urinals	Bathroom Sinks	Kitchen Sinks	Janitors Sink	Drinking Fountain	Shower	
Men	Women (Unisex)						Men	Women (Unisex)
1	1	1	2	1	1	0	0	0

Building Heating, Ventilating, and Air Conditioning (HVAC) Systems:

1. The administrative space is heated by a horizontal oil fired forced warm air heater hung from roof purlins of the utility room.
2. The garage space is heated by 2 oil fired forced warm air heaters. One hung from the roof purlins near the west end of the space and one wall mounted at the east end of the space.
3. There are two (2) separate oil tanks serving these units. One 500 gallon tank is located at the north east corner of the garage space and a second 275 gallon tank is located in a storage room at the west end of the building.
4. There is no exhaust fan in the vehicle storage areas for exhausting air contaminants, such as vehicle exhaust.
5. The combustible outside air intake for the heater serving the administrative space appears to have been closed off when a fire protection system was installed for the outside air fuel pumps. Make-up air appears to circulate through an open doorway to the main garage space. This allows potential contaminated air in the garage to circulate through the administrative space.
6. Make-up air for the wall hung heater in the garage is directly circulated from the garage space. No fresh air make-up was observed.
7. There are no tail-pipe exhaust systems throughout the main garage structure

Building Electrical System:

1. The building contains a 200 ampere, 120/240 volt, Single-Phase electric service that is located in the storage room near the northwest corner of the building. There is a manual transfer/main disconnect switch located adjacent to the electrical panel.
2. There is reportedly a lack of power capacity for adding new loads to the service such as for higher lighting levels on the vehicle storage bays, providing power and lighting for the outbuildings and providing power for maintenance tools and equipment in the garage area.
3. The lighting consists mainly of linear fluorescent fixtures including the garage bays.
4. Power distribution and branch circuit wiring in the building is a mixture of conductors in conduit and armored cable.

Special System Features:

1. There were no fire alarm systems observed.
2. There were no fire suppression system observed.



3. There were no security systems observed.
4. There is an electronic fuel gauge and dispensing gauge system for the diesel and gasoline fuels.

Special Functions:

1. The vehicle service and maintenance activities in the building dictate compliance with NEC Article 511 – Commercial Garages, Repair and Storage.
2. There is exterior storage and dispensing of gasoline and diesel fuels requiring compliance with NYS DEC Petroleum Bulk Storage Regulations and Federal EPA Standards. The tanks are underground.
3. Storage and dispensing of gasoline and diesel fuel, Class I and Class II flammable liquid respectively are regulated by:
  - a. NFPA Standard 30 – Flammable and Combustible Liquids Code
  - b. New York State Bulk Petroleum Storage Regulations
  - c. Federal Environmental Protection Agency Bulk – Petroleum Storage Regulations
  - d. NFPA Standard 30 A – Code for Motor Fuel Dispensing Facilities and Repair Garages
  - e. NEC Article 514 Motor Fuel Dispensing
4. There is one above grade vehicle lift and one engine hoist.
5. There is a Supervisory Control and Data Acquisition System (SCADA) housed in a small room within the administrative space. This system remotely monitors the wells and pumping system at the Clarksville Water District.



**APPENDIX B**  
**PROGRAMMING SUMMARY**



HIGHWAY GARAGE FACILITY IMPROVEMENT STUDY – CONCEPTUAL PHASE  
 Town of New Scotland, Albany County  
 APPENDIX B – PROGRAMMING STUDY

HIGHWAY GARAGE FACILITY - PROGRAMMING PROJECTIONS THRU 2025

PROGRAM AREA	STAFF				Area (square feet) Projected				Equipment Projected			Alternative #1 Addition			Alternative #2 New Building			
	Present	2015	2020	2025	Present	2015	2020	2025	Present	2015	2020	2025	Staff	Area (sf)	Equipment	Staff	Area (sf)	Equipment
Administration					0									1,100			1,725	
▲ Highway																		
Office (Private) Superintendent	1 (2)	1 (2)	1	1												1		
Office (Open) Administration	1 + 1/4 (1) (3)	1 + 3/4 (4)	1 + 3/4 (4)	2												2		
▲ Public Works																		
Office (Private) Superintendent	0 (2)	0	1	1												1		
Office (Open) Administration	1/4 (1) (3)	1/4 (4)	1/2 (5)	1/2 (4)												0		
▲ Recycling																		
Office (Private) Superintendent	0 (2)	0	0	0												0		
Office (Open) Administration	0	0	1/4 (4)	1/2 (4)												0		
▲ Common Use Areas																		
Bathrooms Men's					(1)												170	
Women's					(1)												170	



HIGHWAY GARAGE FACILITY IMPROVEMENT STUDY – CONCEPTUAL PHASE  
Town of New Scotland, Albany County  
APPENDIX B – PROGRAMMING STUDY

PROGRAM AREA	STAFF					Area (square feet) Projected			Equipment Projected			Alternative #1 Addition			Alternative #2 New Building			
	Present	2015	2020	2025	Present	2015	2020	2025	Present	2015	2020	2025	Staff	Area (sf)	Equipment	Staff	Area (sf)	Equipment
Crew Facilities																		
▲ Highway					550													
Office (Shared) Foreman Mechanic	1+1/2 (5) 1	1+1/2 (5) 1	2 1+1/2 (5)	2 2	130 65								2 1	75 75		2 1	60 60	
No Office Laborers/Operators	12	13	14	15									15			15		
▲ Public Works																		
Office (Shared) Foreman	1	1	0	0									0			0		
No Office Laborers/Operators	0	0	1/2 (5)	1									1			1		
▲ Recycling																		
Office (Shared) Foreman	0	0	1	1									1			1		80
No Office Laborers/Operators	1/2 (5)	1/2 (5)	1/2 (5)	1/2 (5)									1			1		
▲ Common Use Areas																		
Training Room					180								16	250		25	400	
Break Room					180								10-14	250		14-16	400	
Kitchen					30									55			85	
Locker Area Men's Women's					20									135 135			140 140	
Bathrooms Men's Women's					80 (6)									170 170			190 190	





HIGHWAY GARAGE FACILITY IMPROVEMENT STUDY – CONCEPTUAL PHASE  
Town of New Scotland, Albany County  
APPENDIX B – PROGRAMMING STUDY

PROGRAM AREA	STAFF			Area (square feet) Projected			Equipment Projected			Alternative #1 Addition			Alternative #2 New Building					
	Present	2015	2020	2025	Present	2015	2020	2025	Present	2015	2020	2025	Staff	Area (sf)	Equipment	Staff	Area (sf)	Equipment
Automotive Fluid Storage					160									270			225	
▲ Highway					160									270			225	
Sign Shop					400									580			775	
▲ Highway					400									580			770	
Animal Control Storage					100									125			180	
▲ Highway					100									125			180	
Recycling					60									125			150	
▲ Highway					60									125			150	
Utility					220									550			425	
▲ Highway					220									550			425	

- Notes
- (1) Located offsite at a separate facility.
  - (2) Superintendent presently split between all departments
  - (3) Employee works 1/2 time between 2 departments.
  - (4) Employee works full time between 2 departments.
  - (5) Employee works 1/2 time.
  - (6) Unisex Bathroom



**APPENDIX C.0.1  
EXISTING BUILDING LAYOUT**



Client/Project: TOWN OF NEW SCOTLAND HIGHWAY GARAGE  
 IMPROVEMENT ALTERNATIVE STUDY  
 08/09/2011  
 190710348

Figure No. A-001  
 Title EXISTING FLOOR PLAN



**APPENDIX C.1.1**  
**CONCEPTUAL LAYOUT – ALTERNATIVE 1 SITE PLAN**





**APPENDIX C.1.2**  
**CONCEPTUAL LAYOUT – ALTERNATIVE 1 SCHEMATIC PLAN**



08/09/2011  
 198710348  
 Client/Project: TOWN OF NEW SCOTLAND HIGHWAY GARAGE  
 IMPROVEMENT ALTERNATIVE STUDY  
 Figure No: A-101  
 Title: ALTERNATIVE #1 FLOOR PLAN



**APPENDIX C.2.1**  
**CONCEPTUAL LAYOUT – ALTERNATIVE 2 SCHEMATIC PLAN**





**APPENDIX D.1.1**  
**CONCEPTUAL BUILDING SYSTEM DESCRIPTION: ALTERNATIVE 1 – SITE WORK**

Alternative 1 involves the complete renovation and reconfiguration of the existing highway garage structure and the construction of a new one-story administrative addition. All work will occur on the existing property and will be phased to ensure continued operation of all major functions of the existing highway garage facility during construction. The major construction phases anticipated for this project are as follows:

1. Construction of one-story, 5400 sq. ft. administrative/support space addition to the north of the existing highway garage structure, including all associated site improvements, modifications and utility connections.
- 2a. Demolition and removal of 1550 sq. ft. of existing administrative/support space along east face of garage structure.
- 2b. Full renovation and modification of the existing heated vehicle storage area to provide for truck access from the east.

Site improvements, modifications and utility connections shall be sequenced to allow for uninterrupted of major facility operations.

The following is a general overview of the primary site work components and systems anticipated for Alternative 1 work scope:



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## ALTERNATIVE 1 - SITE

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- **SOILS CONDITIONS**

To be field verified. Shallow bedrock is anticipated to along the North, West and South edges of the existing highway garage structure.
- **STORM DRAINAGE**

Existing drainage patterns will be maintained. It is anticipated that the disturbance will be less than 1 acre and therefore require no NYSDEC construction SPDES permit. Drive lanes, parking areas and the new building addition will drain to a new catch basin collection system. Collection system will discharge into an existing 15" culvert which daylights on the grass slope along New Scotland Road (NYS Route 85).
- **WATER SERVICE**

A new well is to be constructed onsite in accordance with NYSDOH Appendix 5-B standards. Water sample analysis will dictate potential requirement for softening system to mitigate hardness levels and possibly a treatment system to mitigate chlorides. Existing well will be abandoned in accordance with NYSDOH Appendix 5-A (Recommended Standard for Waterworks).
- **SANITARY SEWER**

Existing septic field to be decommissioned as required for building expansion. A new septic tank and gravity distribution system shall be constructed in an alternate location onsite. All new work will be in accordance with NYSDOH regulations (10NYCRR App. 75-A).
- **ELECTRICAL SERVICE**

Existing single phase service is inadequate to support the expanded facilities demand. It will be necessary to upgrade to an 800 amp, 3 phase service. Existing ground mounted transformer will be removed and upgraded to support new 3 phase service. Additional overhead service wires will need to be installed along poles between Thacher Park Road and onsite utility pole. Additional underground service wires will need to be installed between the new ground mounted transformer and the garage and pole barn storage building.
- **TELEPHONE / DATA / SCADA**

It is anticipated that SCADA control for town wide infrastructure will be upgraded and centralized at the Highway Garage in the near future. Existing layout and space requirements will remain unchanged. Conduit will be required to provide connection between the control panel in the Monitoring room to an antenna located outside. Currently



the antenna is mounted on the garage roof. This may be relocated to a pole or higher structure in the future. Provisions for relocation of the radio wire should be provided.

- ASPHALT PAVEMENT
  - See plan sheet CP-1 for conceptual limits.
  - A) Pavement Section for Employee Parking
    - 1.5" Asphalt top course (Type 6)
    - 2.5" Asphalt binder course (Type 3)
    - 4" Compacted crushed gravel (Type 2)
    - 8" Compacted gravel subbase (Type 4)
    - 1 layer stabilization fabric
  - B) Pavement Section for Heavy Vehicle Traffic
    - 2" Asphalt top course (Type 6)
    - 4" Asphalt binder course (Type 3)
    - 6" Compacted crushed Gravel (Type 2)
    - 12" Compacted Gravel Subbase (Type 4)
    - 1 layer stabilization fabric
- SIDEWALKS
  - New concrete sidewalk at entranceway and along building providing access to/from the handicap parking stalls.
- SITE LIGHTING
  - Maintain existing and install new building mounted fixtures where required. Relocate existing pole mounted fixtures at the fuel island to new fuel island location. Verify other existing site lighting in in good working condition, repair/replace if necessary.
- PAVEMENT MARKINGS
  - 4" white latex paint for regular parking striping. 4" Blue latex paint for handicap striping and unloading hatch zone.
- FUEL DISBURSEMENT
  - A) Existing fuel dispensing island to be removed and relocated as shown on plan sheet CP-1. Salvage existing pumps, light pole with fixtures, and other applicable appurtenances for reuse.
  - B) Existing underground diesel and gasoline storage tanks shall remain in their current location. Piping from new fuel island location to existing tanks will be required.
- OIL/WATER SEPARATOR
  - 2,000 gallon oil/water separator for treatment of floor drain runoff from garage bays. Discharge effluent to existing catch basin on southern side of building.
- - SITE SPECIALTIES
    - 4" steel, concrete filled pipe bollards at garage doors, building corners, and transformer pad.



**APPENDIX D.1.2**  
**CONCEPTUAL BUILDING SYSTEM DESCRIPTION: ALTERNATIVE 1 – BUILDING WORK**

Alternative 1 involves the complete renovation of the existing highway garage structure and the construction of a new one-story administrative addition at the current site. The work will occur in phases to ensure continued operation of all major functions of the existing highway garage facility during construction. The major construction phases anticipated for this project are as follows:

1. Construction of one-story, 5400 sq. ft. administrative/support space addition to the north of the existing highway garage structure, including all associated site improvements, modifications and utility connections.
- 2a. Demolition and removal of 1550 sq. ft. of existing administrative/support space along east face of garage structure.
- 2b. Full renovation and modification of the existing heated vehicle storage area to provide for truck access from the east.

The following is a general overview of the primary building work components and systems anticipated for Alternative 1 work scope:



---

## ALTERNATIVE 1 – BUILDING

## BUILDING ENVELOPE

---

The existing Garage structure is constructed of a series of 15'-4" wide steel framing bays spanning north-south between exterior walls and a center row of columns. The new addition housing administration/support facilities and storage space shall be constructed directly to the north of the existing garage. Proposed framing shall consist of 30'-0" x 30'-0" steel framing bays with steel bar joists supported by structural steel girders.

- FOOTINGS

*Addition:*

- A) Continuous cast in place concrete spread footings at exterior walls (4'-0" below finished grade).
- B) Isolated cast in place concrete spread footings at interior columns (2'-0" below finished floor).
- C) Subject to foundation investigation and geotechnical recommendations.

*Existing Building:*

- A) Existing footings to remain.

- FOUNDATION WALLS

*Addition:*

- A) 8" cast in place concrete

*Existing Building:*

- A) Existing foundation walls to remain.

- FLOOR SYSTEM (AT GRADE)

*Addition:*

- A) 5" concrete slab on grade (4,000 psi) reinforced with #4 bars at 18" o.c. each way.
- B) 6 mil reinforced vapor barrier below 6" granular subbase.
- C) Subject to foundation investigation and geotechnical recommendations.

*Existing Building:*

- A) Existing concrete slab on grade to remain.
- B) Repair concrete at areas of drain modifications.

- STRUCTURAL FRAMING SYSTEM (ROOF)

*Addition:*

- A) Structural steel frame with HSS 6x6 columns and rolled structural steel girders
- B) Steel bar joists with 1 ½" galvanized metal deck

*Existing Building:*

- A) Existing steel framing to remain.
- B) Modify steel framing at east wall as necessary for installation of overhead doors.



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**ALTERNATIVE 1 – BUILDING**

**BUILDING ENVELOPE**

---

- FOUNDATION WATERPROOFING
  - A) 60 mil Bituthene rubberized asphalt membrane system with protection.
  
- WALL CONSTRUCTION
  - Addition:*
    - A) Veneer
      - 4" masonry veneer split face block (4"x4"x16") – (0'-0" – 4'-0")
      - Precast concrete watertable
      - 4" factory foam insulated metal panel (4'-0" – 16'-0").
    - B) Airspace
    - C) Structure
      - 6" 18 gauge structural gauge galvanized steel studs at 16" o.c.
      - 2" 20 gauge strap bridging at 4'-0" o.c. vertically each face of stud
      - 2" closed cell spray applied polyurethane foam insulation installed by an Air Barrier Association of America approved applicator.
      - 5/8" gypsum board
  - Existing Building:*
    - A) Existing exterior walls to remain.
  
- MASONRY WALL FLASHING
  - Addition:*
    - A) Masonry walls will contain through wall flashing, pan flashing, weep vents and mortar netting.
  
- ALUMINUM FRAME WINDOWS
  - Addition:*
    - A) Kawneer 451T framing system (custom color)
    - B) Multi-glazed low-e glazing system.
    - C) (3'-6" x 6'-0")
  
- DOORS
  - Addition:*
    - A) At Exterior  
Door and frame: Heavy Duty Insulated hollow metal doors in welded thermally broken hollow metal frames.
  
- OVERHEAD DOORS
  - Existing:*
    - A) (17'-0" x 14'-0") heavy duty overhead doors with operator.



- ROOF
  - Addition:*
  - A) Single-Ply
    - Membrane roof system (high albedo rated-white)  
mechanically attached:
      - Single ply mechanically attached 45 mil reinforced Ethylene Propylene Membrane
      - Polyisocyanurate roof insulation continuous 3" over entire roof with tapered build-up to provide necessary drainage.
      - Walkway surface: Reinforced ethylene propylene walkway (36" wide) hot welded at all maintenance paths of travel on roof
  
- ROOF ACCESSORIES
  - Addition:*
  - A) Roof scuttle with ladder-up.
  
- ROOF DRAINAGE SYSTEM
  - Addition:*
  - A) Redundant roof drains in flat roof



---

**ALTERNATIVE 1 – BUILDING****BUILDING INTERIOR**

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- WALL CONSTRUCTION
  - A) Partition walls:
    - Administration and Crew Facilities (constructed 10'-0" high)
      - 3-5/8", 18 gauge steel studs 16" o.c.
      - 2" 20 gauge strap bridging at 4'-0" o.c. vertically.
      - 4" sound deadening insulation
      - 5/8" gypsum board.
      - Finish painted
    - Utilities, Parts Storage, Fluid Storage, Animal Storage and Recycling (constructed full height to underside of metal deck 16'-0")
      - 8" concrete masonry unit walls
      - Continuous single wythe horizontal joint reinforcement 16" o.c. vertically
      - Vertical reinforcement #5 @ 16" o.c.
      - Finish painted
  - B) Due to Building Code occupancy separation requirements the garage storage / Garage Maintenance will be separated from the storage and administration areas by a fire separation wall (constructed full height to underside of metal deck 16'-0")
    - 8" concrete masonry unit walls
    - Continuous single wythe horizontal joint reinforcement 16" o.c. vertically
    - Vertical reinforcement
    - Finish painted
- CEILING CONSTRUCTION
  - A) 15/16" T Section metal grid suspension system with 24" x 24" lay in acoustical ceiling panels
  - B) 1/2" gypsum board on a 24" x 24" heavy duty suspension system
  - C) Moisture-resistant grid in the following locations:
    - Toilet Rooms
  - D) Wet area suspended ceiling tile system in Locker Rooms
- FLOOR FINISHES
  - A) Carpet: To be provided in the following spaces:
    - Offices
    - Corridors
  - B) Vinyl Composite Tile in the following spaces:
    - Toilet
    - Locker Rooms



- WALL FINISHES
  - A) Standard paint on most surfaces.
  - B) Ceramic tile on shower areas of locker rooms.
  
- DOORS (INTERIOR)
  - A) Wood veneer solid core doors (stain grade-cherry) welded hollow metal frames for the following areas:
    - Offices
  - B) Hollow metal doors in welded hollow metal frames for the following areas:
    - Mechanical Rooms
    - Electrical Rooms
    - Locker Rooms
    - Storage
    - Parts Rooms/Storage spaces
  
- HARDWARE
  - A) Sargent mortise locks (function as required) with lever trim (all interior doors that do not require exit devices)
  - B) VonDuprin exit devices with lever trim
  - C) LCN closers (magnetic hold open where required)
  - D) Stanley butt hinges
  
- SPECIALTIES
  - A) Fire extinguishers, cabinets and accessories.
  - B) Toilet Accessories:
    - Towel hooks
    - Toilet paper dispensers
    - Stainless steel shelves on brackets
    - Soap Dispensers
    - Paper Towel Dispensers
    - Mirrors
    - Accessible stall hardware
    - Sanitary napkin vendors
    - Sanitary napkin disposal
  - C) Toilet Partitions: Overhead braced ceiling hung partitions and wall hung urinal screens. Solid surface polymer material.
  - D) Recessed pedimat entrance mat at main entrance
  - E) ADA required signage





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**ALTERNATIVE 1 – BUILDING**

**HVAC SYSTEMS**

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- HOT WATER BOILER SYSTEM
  - A) (2) High efficiency gas fired hot water boiler system sized at 750 MBH including all associated gas piping, outdoor tank, and flues.
  - B) Boiler system shall feed hot water baseboard heating in the administration areas.
  - C) Provide (2) 40 GPM hot water pumps
  
- ADMINISTRATIVE AREA SYSTEMS
  - A) Packaged roof top units with gas-heating and electric cooling.
    - 1 @ 12 tons for perimeter space
    - 1 @ 10 tons for interior space
    - 1 @ 4 tons for conference/break room
  - B) The administrative areas shall be served with fin tube radiation within custom sheet metal enclosures below windows.
  - C) Provide separate VVT and zone control for each office and work space area.
    - Assume (4) VAV boxes
  
- GARAGE STORAGE AREA SYSTEMS
  - A) Provide gas fired tube heater in aisle spaces between vehicles in storage areas.
  - B) Provide hot water unit heaters served by boiler system in vehicle maintenance areas.
  - C) Provide gas fired make-up air unit that shall run whenever one of the exhaust systems is on.
  - D) Provide a tail pipe exhaust system with one connection at service/maintenance bay.
  
- BUILDING SYSTEM MANAGEMENT
  - A) Single integrated system for monitoring and control of HVAC, fire alarm, and access control.
  - B) Provide a 'front end' system including hardware, software, graphics, wiring, and terminations.
  
- EXHAUST FAN SYSTEMS
  - A) Provide separate exhaust fans for the following areas:
    - Main entrance vestibule
    - Toilet rooms
    - Fluid storage space
    - Animal storage space
  - B) Provide welding exhaust system with a fan capacity of 2200 CFM in vehicle maintenance bay complying with OSHA regulations 1910 and 1926.



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**ALTERNATIVE 1 – BUILDING****ELECTRICAL SYSTEMS**

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- ELECTRICAL SYSTEM UPGRADES
  - A) Provide new 277/480 volt/3-phase/4-wire service with an 800-ampere capacity.
  - B) Provide standard NMPC underground pad mounted transformer service.
  - C) Provide new 1000 ampere service entrance switchboard plus a 150 kVA dry type transformer 120/208/3-phase/4-wire secondary to back feed the existing system.
  
- POWER DISTRIBUTION
  - A) Panelboards shall be located in electrical closets.
  - B) Photocopiers/printers/etc. shall be fed by independent homeruns to the electrical panels.
  - C) Provide three pole, 20 A circuits to serve room enclosures/offices. Homeruns shall consist of (3) #12 AWG+(1)#8 AWG+(1)#12G.
  - D) Receptacles shall be provided on each wall of room enclosures and at each interior column.
  
- LIGHTING
  - A) All exit signs and emergency lights shall be distributed per Code requirements.
  - B) Provide all offices and enclosed room with 2'x4' lay-in fluorescent parabolic fixtures with (2) T5 lamps and electronic ballasts.
    - Provide (1) fixture for every 64 sq. ft. of area
  - C) Provide conference/break room with dimming parabolic fixtures with (2) zones of dimming.
  - D) Provide storage and repair/maintenance bays with low bay 400 watt HID fixtures to provide an average foot-candle level of 30 fc.
  - E) Provide building mounted HID utility wall packs at exterior exit doors.
  
- FIRE ALARM
  - A) Provide fire and smoke detection system as follows:
    - Provide analog addressable fire alarm and detection system throughout
    - Full ADA compliant horn and strobe coverage throughout
    - Manual pull stations at all exits
    - Duct smoke detectors and shutdown interlocks with the air handling systems for all RTU's
    - Assume (10) doors require magnetic holders
    - Heat detectors in garage bays



**APPENDIX D.2.1**  
**CONCEPTUAL BUILDING SYSTEM DESCRIPTION: ALTERNATIVE 2 – BUILDING WORK**

Alternative 2 involves the construction of a new garage structure with administrative space on an appropriate site. The site location could include the existing property or a new site location to be determined. Continued operation of all major functions of the existing highway garage would be possible as a new building is constructed. The major construction phases anticipated for this alternative are as follows:

1. Site selection and improvements. The scope of this work is site specific and to be determined.
2. Construction of one-story, 22,000 sq. ft. highway garage structure with administrative/support space.

The following is a general overview of the primary building systems anticipated for Alternative 2 work scope:



---

**ALTERNATIVE 2 – BUILDING****STRUCTURAL SYSTEM**

---

The new garage structure shall be constructed of a series of pre-engineered moment frames with two rows of interior columns. Spacing of each frame shall be approximately 20'-0" and interior columns shall be spaced at roughly 45'-0". The administrative/support facility space shall be directly adjacent to the garage structure and framed with 30'-0"x30'-0" steel framing bays with steel bar joists and structural steel girders.

- FOOTINGS
  - A) Continuous cast in place concrete spread footings at exterior walls (4'-0" below finished grade) .
  - B) Isolated cast in place concrete spread footings at interior columns (2'-0" below finished floor).
  - C) Subject to foundation investigation and geotechnical recommendations.
  
- FOUNDATION WALLS
  - 8" cast in place concrete
  
- FLOOR SYSTEM (AT GRADE)
  - A) 5" concrete slab on grade (4,000 psi) reinforced with #4 bars at 18" o.c. each way.
  - B) 6 mil reinforced vapor barrier below 6" granular subbase.
  - C) Embedded tension tie reinforcement as required by building fabricator.
  - D) Subject to foundation investigation and geotechnical recommendations.
  
- STRUCTURAL FRAMING SYSTEM (ROOF)
  - A) Pre-engineered steel moment frames at 20'-0" o.c. with 2 rows of interior columns (Garage Structure)
  - B) Structural steel frame with HSS 6x6 columns and rolled structural steel girders (Administrative/Support Space Structure)
  - C) Steel bar joists with 1½"galvanized metal deck



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**ALTERNATIVE 2 – BUILDING**

**BUILDING ENVELOPE**

---

- FOUNDATION WATERPROOFING
  - A) 60 mil Bituthene rubberized asphalt membrane system with protection.
  
- WALL CONSTRUCTION
  - Garage:*
    - A) Veneer
      - 4" masonry veneer split face block (4"x4"x16") – (0'-0" – 4'-0")
      - Precast concrete watertable
      - 4" factory foam insulated metal panel (4'-0" – 20'-0").
    - B) Airspace
    - C) 4" rigid wall insulation
    - D) Structure
      - 8" concrete masonry unit wall
  - Office:*
    - A) Veneer
      - 4" masonry veneer split face block (4"x4"x16") – (0'-0" – 4'-0")
      - Precast concrete watertable
      - 4" factory foam insulated metal panel (4'-0" – 14'-0").
    - B) Airspace
    - C) Structure
      - 6" 18 gauge structural gauge galvanized steel studs at 16" o.c.
      - 2" 20 gauge strap bridging at 4'-0" o.c. vertically each face of stud
      - 2" closed cell spray applied polyurethane foam insulation installed by an Air Barrier Association of America approved applicator.
      - 5/8" gypsum board
  
- MASONRY WALL FLASHING
  - A) Masonry walls will contain through wall flashing, pan flashing, weep vents and mortar netting.
  
- ALUMINUM FRAME WINDOWS
  - A) Kawneer 451T framing system (custom color)
  - B) Multi-glazed low-e glazing system.
  - C) (3'-6" x 6'-0")



- DOORS
  - A) At Exterior  
Door and frame: Heavy Duty Insulated hollow metal doors in welded thermally broken hollow metal frames.
  
- OVERHEAD DOORS
  - A) (17'-0 x 14'-0") heavy duty overhead doors with operator.
  
- ROOF
  - A) Single-Ply  
Membrane roof system (high albedo rated-white) mechanically attached:
    - Single ply mechanically attached 45 mil reinforced Ethylene Propylene Membrane
    - Polyisocyanurate roof insulation continuous 3" over entire roof with tapered build-up to provide necessary drainage.
    - Walkway surface: Reinforced ethylene propylene walkway (36" wide) hot welded at all maintenance paths of travel on roof
  
- ROOF ACCESSORIES
  - A) Roof scuttle with ladder-up.
  
- ROOF DRAINAGE SYSTEM
  - A) Redundant roof drains in flat roof



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**ALTERNATIVE 2 – BUILDING**

**BUILDING INTERIOR**

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- WALL CONSTRUCTION
  - A) Partition walls:
    - Administration and Crew Facilities (constructed 10'-0" high)
      - 3-5/8", 18 gauge steel studs 16" o.c.
      - 2" 20 gauge strap bridging at 4'-0" o.c. vertically.
      - 4" sound deadening insulation
      - 5/8" gypsum board.
      - Finish painted
    - Utilities, Parts Storage, Fluid Storage, Animal Storage and Recycling (constructed full height to underside of metal deck 16'-0")
      - 8" concrete masonry unit walls
      - Continuous single wythe horizontal joint reinforcement 16" o.c. vertically
      - Vertical reinforcement #5 @ 32" o.c.
      - Finish painted
  - B) Due to Building Code occupancy separation requirements the garage storage / Garage Maintenance will be separated from the storage and administrations areas by a fire separation wall (constructed full height to underside of metal deck 16'-0")
    - 8" concrete masonry unit walls
    - Continuous single wythe horizontal joint reinforcement 16" o.c. vertically
    - Vertical reinforcement
    - Finish painted
- CEILING CONSTRUCTION
  - A) 15/16" T Section metal grid suspension system with 24" x 24" lay in acoustical ceiling panels
  - B) 1/2" gypsum board on a 24" x 24" heavy duty suspension system
  - C) Moisture-resistant grid in the following locations:
    - Toilet Rooms
  - D) Wet area suspended ceiling tile system in Locker Rooms
- FLOOR FINISHES
  - A) Carpet: To be provided in the following spaces:
    - Offices
    - Corridors
  - B) Vinyl Composite Tile in the following spaces:
    - Toilet
    - Locker Rooms



- WALL FINISHES
  - A) Standard paint on most surfaces.
  - B) Ceramic tile on shower areas of locker rooms.
  
- DOORS (INTERIOR)
  - A) Wood veneer solid core doors (stain grade-cherry) welded hollow metal frames for the following spaces:
    - Offices
  
  - B) Hollow metal doors in welded hollow metal frames for the following areas:
    - Mechanical Rooms
    - Electrical Rooms
    - Locker Rooms
    - Storage
    - Parts Rooms/Storage spaces
  
- HARDWARE
  - A) Sargent mortise locks (function as required) with lever trim (all interior doors that do not require exit devices)
  - B) VonDuprin exit devices with lever trim
  - C) LCN closers (magnetic hold open where required)
  - D) Stanley butt hinges
  
- SPECIALTIES
  - A) Fire extinguishers, cabinets and accessories.
  - B) Toilet Accessories:
    - Towel hooks
    - Toilet paper dispensers
    - Stainless steel shelves on brackets
    - Soap Dispensers
    - Paper Towel Dispensers
    - Mirrors
    - Accessible stall hardware
    - Sanitary napkin vendors
    - Sanitary napkin disposal
  - C) Toilet Partitions: Overhead braced ceiling hung partitions and wall hung urinal screens. Solid surface polymer material.
  - D) Recessed pedimat entrance mat at main entrance
  - E) ADA required signage



**ALTERNATIVE 2 – BUILDING**

**PLUMBING SYSTEMS**

- DOMESTIC WATER HEATING SYSTEM
  - A) New energy efficient gas-fired domestic water heater.
- VALVES
  - A) Isolation valves shall be provided at each toilet room.
  - B) Provide balancing valve and check valve for the hot water recirculating line at each group of fixtures.
- CLEANOUTS
  - A) Provide as required by Code and proper maintenance of gas system.
- FIXTURES
  - A) Showers 2 (1 M, 2 W)
  - B) Drinking Fountains 1
  - C) Water Closets 3 (1 M, 2 W)
  - D) Urinals 1
  - E) Bathroom Sinks 4
  - F) Kitchen Sink 1
  - G) Janitor Sink 1
  - H) Floor Drains 6
  - I) Roof Drains 3 (new)
- PIPING (GAS)
  - A) Provide all gas piping from exterior tanks to all gas-fired heating equipment as described under HVAC systems.



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**ALTERNATIVE 2 – BUILDING****HVAC SYSTEMS**

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- HOT WATER BOILER SYSTEM
  - A) (2) High efficiency gas fired hot water boiler system sized at 750 MBH including all associated gas piping, outdoor tank, and flues.
  - B) Boiler system shall feed hot water baseboard heating in the administration areas and radiant slab in garage areas.
  - C) Provide (2) 40 GPM hot water pumps
  
- ADMINISTRATIVE AREA SYSTEMS
  - A) Packaged roof top units with gas-heating and electric cooling.
    - 1 @ 12 tons for perimeter space
    - 2 @ 10 tons for interior space
    - 1 @ 4 tons for conference/break room
  - B) The administrative areas shall be served with fin tube radiation within custom sheet metal enclosures below windows.
  - C) Provide separate VVT and zone control for each office and work space area.
    - Assume (4) VAV boxes
  
- GARAGE STORAGE AREA SYSTEMS
  - A) Provide radiant heated slab
  - B) Provide gas fired make-up air unit that shall run whenever one of the exhaust systems is on.
  - C) Provide a tail pipe exhaust system with one connection at service/maintenance bay.
  
- BUILDING SYSTEM MANAGEMENT
  - A) Single integrated system for monitoring and control of HVAC, fire alarm, and access control.
  - B) Provide a 'front end' system including hardware, software, graphics, wiring, and terminations.
  
- EXHAUST FAN SYSTEMS
  - A) Provide separate exhaust fans for the following areas:
    - Main entrance vestibule
    - Toilet rooms
    - Fluid storage space
    - Animal storage space
  - B) Provide welding exhaust system with a fan capacity of 2200 CFM in vehicle maintenance bay complying with OSHA regulations 1910 and 1926.



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**ALTERNATIVE 2 – BUILDING****ELECTRICAL SYSTEMS**

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- ELECTRICAL SYSTEM
  - A) Provide new 277/480 volt/3-phase/4-wire service with an 800-ampere capacity.
  - B) Provide standard NMPC underground pad mounted transformer service.
  - C) Provide new 1000 ampere service entrance switchboard plus a 150 kVA dry type transformer 120/208/3-phase/4-wire secondary to back feed the existing system.
  
- POWER DISTRIBUTION
  - A) Panelboards shall be located in electrical closets.
  - B) Photocopiers/printers/etc. shall be fed by independent homeruns to the electrical panels.
  - C) Provide three pole, 20 A circuits to serve room enclosures/offices. Homeruns shall consist of (3) #12 AWG+(1)#8 AWG+(1)#12G.
  - D) Receptacles shall be provided on each wall of room enclosures and at each interior column.
  
- LIGHTING
  - A) All exit signs and emergency lights shall be distributed per Code requirements.
  - B) Provide all offices and enclosed room with 2'x4' lay-in fluorescent parabolic fixtures with (2) T5 lamps and electronic ballasts.
    - Provide (1) fixture for every 64 sq. ft. of area
  - C) Provide conference/break room with dimming parabolic fixtures with (2) zones of dimming.
  - D) Provide storage and repair/maintenance bays with low bay 400 watt HID fixtures to provide an average foot-candle level of 30 fc.
  - E) Provide building mounted HID utility wall packs at exterior exit doors.
  
- FIRE ALARM
  - A) Provide fire and smoke detection system as follows:
    - Provide analog addressable fire alarm and detection system throughout
    - Full ADA compliant horn and strobe coverage throughout
    - Manual pull stations at all exits
    - Duct smoke detectors and shutdown interlocks with the air handling systems for all RTU's
    - Assume (10) doors require magnetic holders
    - Heat detectors in garage bays



**APPENDIX E**  
**CONSTRUCTION COST ESTIMATES: ALTERNATIVE OPTIONS 1 & 2**

Plans and documentation were provided to a local General Contractor with extensive experience constructing similar facilities. The contractor was asked to provide a preliminary construction cost estimate for Alternatives 1 and 2. See below for construction estimate:

**Town of New Scotland**  
**Highway Garage Facility Improvement**



**Conceptual Estimate**

Date: November 11, 2011

<b>OPTION 1</b>		<b>Range: \$2.0 - 2.5 million</b>	
<b>Scope of Work</b>	<b>Square Footage</b>	<b>Cost</b>	
Addition	5,400	\$	1,080,000
Renovation	9,630	\$	963,000
Demolition of Existing Building	1,550	\$	30,000
Island Relocation		\$	80,000
Septic		\$	40,000
New Pavement		\$	132,400
Oil/Water Separator		\$	20,000
Transformer Pad		\$	10,000
Well		\$	20,000
<b>Total Option 1</b>		<b>\$</b>	<b>2,375,400</b>

<b>OPTION 2</b>		<b>Range: \$4.0 - 4.5 million</b>	
<b>Scope of Work</b>	<b>Square Footage</b>	<b>Cost</b>	
New Building	22,000	\$	3,850,000
New Fuel Tanks		\$	150,000
Septic		\$	40,000
Oil/Water Separator		\$	20,000
Well		\$	20,000
<b>Total Option 2</b>		<b>\$</b>	<b>4,080,000</b>

NOTE: Items not included in Option 2  
 a) Site development costs  
 b) Demolition or renovation of existing building