



**SECTION 1**  
**DEPARTMENT OF PUBLIC**  
**WORKS FACILITIES – 24 NEW BOSTON ROAD**

**INTRODUCTION**

The following report was prepared for the Town of Norwich Vermont by a team of professionals assembled by Mink Brook Management, LLC with the intent to identify the code and functional deficiencies within the three Town buildings housing the Department of Public Works, the Town Police Department, and the Town Fire Department. We have included in this report budget figures showing estimated costs to bring these buildings up to code and meet the functional standards typical for each department if these buildings were new today. The standards were identified by the team of professionals who have designed and constructed complexes in each of the categories discussed. We understand that each of these buildings is in need of maintenance work at this time and there are line items in the budget showing some of the maintenance repairs identified during our inspections. It is not the intent of this report to try to sway the Town of Norwich to perform the remedial work as described as it may not be in the best interest of the Town to do so. It is the intent of the report to inform the Town of Norwich of the costs associated with the work described if in fact remedial work was to be done to each of the existing buildings. The results from previous studies were reviewed and considered while going through the inspection process in each of the buildings mentioned.

The existing Department of Public Works Garage was built in 1976, the steel framed building is 80 ft. by 50 ft., 4,000square feet, Type IIB, unprotected non-combustible construction. The building has a fire alarm system but no sprinkler system, adequate bathroom and locker facilities, or any clean place for the employees to sit down for lunch or a meeting. The existing facility has a floor drain that will have to be brought up to meet UIC and Vermont standards just like the Fire Station floor drain mentioned earlier in this report. Additional room must be made to house Flammable Liquid and Materials away from the everyday workshop of the DPW and certainly away from all welding, torch, or other activities that could create a spark. This facility has a generator for back up electric power but it is questionable whether or not this facility has the correct sized service for the needs of 2012, and it will certainly have to be upgraded if additional space is acquired. Additionally there is no room for an office and computer, currently the director makes use of his own computer. and is in dire need of a roof replacement.

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## 1. Summary

- 1.1. The building is too small to store, and maintain the current vehicles and equipment. The building was originally constructed as a garage for several vehicles and equipment. It is inadequate by size and design to provide the necessary space for the administration, maintenance, and storage needs of the Public Works Department.
- 1.2. Bathroom facilities are inadequate and there is no place for employees to change clothes and shower.
- 1.3. There is no office space. The public works director has a desk on the shop floor.
- 1.4. There is no space, other than a table on the shop floor, for employee meals.
- 1.5. Repair work interferes with the administration of the Department. Noise and dusty conditions make it impossible to have a computer in the garage.

## 2. Functional Deficiencies

- 2.1. Storage Areas
  - 2.1.1. The building was originally constructed to house three trucks and a loader. There is no room to store any of the added equipment purchased by the Town since that time. A backhoe, loader, eight trucks, two graders and two roadside mowing tractors have no place to be stored undercover, say nothing of the smaller miscellaneous equipment and attachments.
- 2.2. Office Space
  - 2.2.1.1. There is no office space for the Public Works Director. A desk on the shop floor serves as an office. The dusty and noisy environment is not acceptable for performing administrative functions. The Public Works Director cannot have a computer in the shop due to the environment. He must answer all e-mail and perform other administrative functions involving a computer after work hours at his residence. The Department of Public Works Review Committee Final Report recommended that there be administrative support for the Public Works Director.<sup>1</sup>
- 2.3. Lack of proper separation of functions in garage bays. Certain specific storage rooms, electrical rooms, mechanical rooms and any other accessory use, incidental use, or required separation of uses must be properly classified in terms of fire-resistant construction. (2006 IBC – Chapters 3, 4, 5, 6 and 7; 2006 NFPA 101 – Chapters 6, 8, 9, 40, 42 and 43)
  - 2.3.1. Storage, operations and management of hazardous materials or processes shall conform to the 2006 edition of NFPA 1, including but not limited to:
    - 2.3.1.1. Chapter 41 – Hot Work Operations Welding and any other “hot work” functions need to conform to 2006 NFPA 1, Chapter 41.
    - 2.3.1.2. Chapter 43 – Spraying, Dipping and Coating Using Flammable or Combustible Materials
    - 2.3.1.3. Chapter 60 – Hazardous Materials
    - 2.3.1.4. Chapter 63 – Compressed Gases and Cryogenic Fluids
    - 2.3.1.5. Chapter 66 – Flammable and Combustible Liquids
    - 2.3.1.6. Additional layer of Fire Code sheetrock installed between the electrical room and the base garage. Estimated Cost ... \$550

<sup>1</sup> Town of Norwich Website <http://72.0.157.4/~norwich/wp-content/uploads/2012/06/DPWFinalReport.pdf>

- 2.3.2. Noise issues
- 2.3.3. Administrative work.

### **3. Building Components and Systems**

#### 3.1. Structural components

3.1.1. This facility is an Occupancy Category IV facility as defined in Table 1604.5 of IBC. The “Importance Factor” (or “I”) is used in calculating snow, wind and seismic forces (NOT dead loads or other live loads). IBC does not include formulas to determining these forces but refers the designer to ASCE 7 “Minimum Design Loads for Buildings and Other Structures” to determine the magnitude of environmental forces. In ASCE 7, there are a number of formulas for calculating these forces and these formulas include the variable “I” along with numerous other variables (i.e. for exposure, site topography, building thermal characteristics, building size/height, soil characteristics, etc.) depending on what environmental force is being calculated. This increases the required design load significantly compared to an occupancy in a lower category. This implies, but does not conclude without further verification, that the existing facility may have a serious code deficiency in terms of the structural requirements of an essential facility. In order to determine whether or not this building would meet the Category IV requirements there would have to be a structural inspection and study performed. This study would have to identify any deficiencies in the building structural frame and supports and identify what procedures would have to be done in order to have the building comply with the regulation. It is our opinion that none of the buildings that we are looking at for the Town of Norwich would comply with this regulation. The buildings are too old and the requirement was not in place when the buildings were first utilized. The building has stood for over 40 years and is structurally as sound as it was when it was built except for the metal roof deck. A new roof actually will serve to lower the amount of snowing loading by eliminating ice damming. The use of Category IV requirements for this building is setting a higher standard than is required by the VT Fire Prevention and Building Code (VTFPBC). The estimated cost for a structural report is \$7,500 per building but the costs could run anywhere between \$5,000 and \$15,000. The mean price of \$7,500 was used in this report.

3.1.2. Roof. The roof system consists of a steel roof deck (approximately 3 feet wide ribbed steel decking) attached to steel purlins. The underside is insulated to the R-3 level. This creates significant ice damming and causes leaks. The decking is fastened using screws with rubber washers. The washers have deteriorated and the decking is split near some of them. As a result the roof leaks year round. A new roof system consisted of rigid insulation and membrane will eliminate the ice problem, reduce the structural load on the roof and stop the leaking. The roof support system will have to be evaluated by a structural engineer to determine the roof’s load carrying capability.

#### 3.2. Energy Efficiency

3.2.1. The roof has an R factor of 3. The excessive heat loss is costly and creates ice dams along the eaves.

3.2.2. The existing exterior walls are poorly insulated and remain at an R factor of 3. The standard R factor for a 2' x 6' wooden frame in anyone’s home would be R-19. It would be a very good idea to improve the insulation characteristics of the building by foaming the walls.

#### 3.3. Shop floor-

#### 3.4. Mechanical Systems

3.4.1. Heating System.

- 3.4.2. Ventilation. In addition to special requirements of other codes (including NFPA 1), proper ventilation is required. Natural ventilation (in lieu of mechanical ventilation) of an occupied space is allowed, provided that the room has doors and/or windows such that the opening to the outdoors is at least 4% of the floor area. (2006 IBC – Section 1203.4)
  - 3.4.2.1. This could be the case if the overhead doors were not available to be opened and left open. This is a problem however in the upper level where the water storage is located. Installation of a louvered vent that will add fresh air intake if opened would be the most reasonable way to remedy the problem. Estimated Cost ... \$950
  - 3.4.2.2. Exhaust Extraction System. There is a fan for the entire building. This is inefficient in terms of cost and ability to remove exhaust fumes.
  - 3.4.2.3. There is an estimate for an exhaust system. This includes an exhaust hose reel and fittings to attach the exhaust hose to trucks when it is required to have a truck running for service.
- 3.4.3. Electrical. Electrical wiring and equipment in spray spaces and vapor areas are required to be of an explosion-proof type approved for use in such hazardous location in accordance with the NEC. (2000 IFC 1503) Electrical upgrades to meet the code will need to be done. Estimated Cost ... \$1,600
- 3.5. Fire Protection Systems.
  - 3.5.1. There is a fire alarm system monitored by the Hanover Dispatch Center. The system is inspected annually and there are no violations.
  - 3.5.2. Building does not have a fire sprinkler system. A system is not required but extremely desirable. The consequences of a fire that extensively damaged public works equipment would be devastating on the community. If the Town of Norwich chose to install a complete fire suppression system for this building the cost would be as follows: Estimated Cost ... \$33,000

#### **4. Americans with Disabilities Act (ADA).**

- 4.1. It is our firm belief that all public buildings should comply with American with Disabilities Act (ADA) requirements for handicap access where practical. Existing buildings are not required by the VTFPBC to be upgraded to meet all ADA standards. The VTFPBC does require that any new addition or construction meet ADA standards. The following codes and associated costs represent the items that would need to be completed in order to have the Public Works building comply with ADA requirements for new construction.
- 4.2. Doors. The existing door can remain in use even though they do not meet ADA standards for new construction. The ADA standards for doors in new construction require;
  - 4.2.1. All doors on an accessible route within the building shall have a minimum clear width of not less than 32" and a minimum height of 80". (ADA 28CFR Ch. 1, 7/1/94 edition, section 4.13.5)
  - 4.2.2. All doors on an accessible route within the building shall have a minimum maneuvering clearance on the pull side of the door of 18". (ADA 28CFR Ch. 1, 7/1/94 edition, section 4.13.6 and figure 25)
  - 4.2.3. Maximum allowable height of a door threshold is ½", with 1:2 bevel. (ADA 28CFR Ch. 1, 7/1/94 edition, section 4.13.8)
  - 4.2.4. Door handles, pulls and latches be no higher than 48" above finished floor and that the handle shall not require tight grasping, pinching or twisting. (ADA 28CFR Ch. 1, 7/1/94 edition, section 4.13.9)
  - 4.2.5. There are four locations this is a problem. Remove the existing doors and install new prefabricated doors, frames, and hardware to meet the code. Estimated Cost ... \$15,000

## **5. Compliance with Applicable Codes and Standards**

- 5.1. VT Fire Prevention and Building Code.
  - 5.1.1. The Division of Fire Safety found 3 minor violations.
    - 5.1.1.1.Storage shall be in accordance with NFPA 1 chapter 60 (oil, POL products)
    - 5.1.1.2.Guard non-compliant on stairs NFPA 101 Chapter 7
    - 5.1.1.3.Move rag bucket away from combustible material NFPA 1.
  - 5.1.2. The building is in compliance with the VTFPBC. The VTFBC includes NFPA 101 Life Safety Code and the 2006 International Building Code.
- 5.2. Vermont Occupational Health and Safety Administration (VOSHA)
  - 5.2.1.1. The project WorkSafe inspection identified several VOSHA violations. All of these have been corrected.

## **6. Functional and Operational Needs Program**

### **6.1. Space needs**

- 6.1.1. Public Works Director Office 200 sq. ft.
- 6.1.2. Administrative Assistant Office 200 sq. ft.
- 6.1.3. Locker Room with showers and bathroom 400 sq. ft.
- 6.1.4. Lunch room with cabinets and appliances 300 sq. ft.
- 6.1.5. Public bathroom ADA unisex. 60 sq. ft.
- 6.1.6. Hazardous Chemical and miscellaneous storage 340 sq. ft. Estimated Cost ...  
\$270,000
- 6.1.7. Outside equipment Storage.
  - 6.1.7.1.Equipment stored outside at the Public Works site includes a backhoe, loader, two graders, chloride truck, three pickup trucks, and two dump trucks
  - 6.1.7.2.This equipment is subject to deterioration from weather conditions and operational readiness when covered in snow, ice etc. the value of this equipment is over 2 million dollars.
  - 6.1.7.3. An estimated space need is 7000 square feet of covered but not necessarily enclosed space.
- 6.1.8. Rented equipment Storage. Public works rents space off-site for the storage of two mowing tractors, and building and grounds trailers and mowers.
- 6.1.9. Buildings and Grounds Department Space and functional needs. The buildings and grounds department needs space for the storage of mowing equipment, fertilizers and other supplies, tools and equipment, a workshop and vehicle and trailer parking. Estimated space needs are 1500 square feet of heated space with an overhead door.
- 6.2. A single story building is desirable since the Public Works director often functions as a “working” supervisor.
- 6.3. The building has value and does what it originally was designed for. The most significant problem with the building is that it is too small for the operations of the public works department. The roof leaks dues to deteriorated fasteners and ice damming. The building is overcrowded suffers from a severe lack of storage space, bathroom facilities, dining and office areas.
- 6.4. The cost to bring the existing building up to the Occupancy Category IV requirement may be cost prohibitive although there is no requirement to meet Category IV requirements for the existing portion of the building. The building appears to be as structurally sound now as it was when it was built.

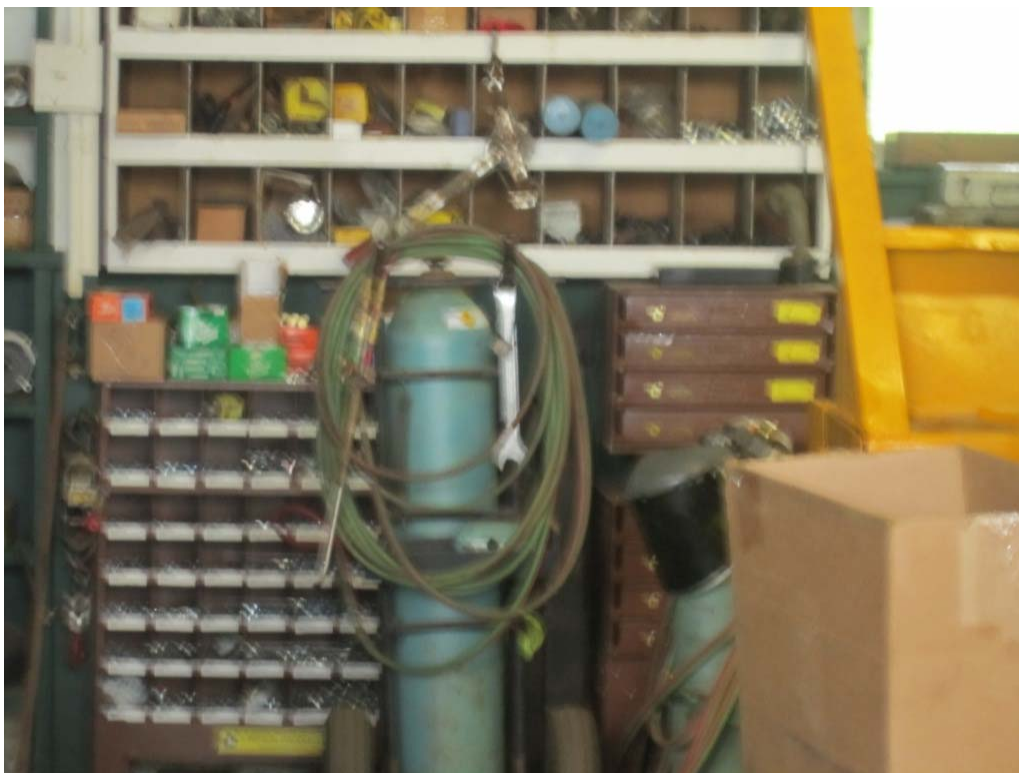
## **7. List of Inspectors and Dates:**

- 7.1. Landon Wheeler, Division of Fire Safety, State of Vermont (March 23, 2012)
- 7.2. Hazel Hunter, Project WorkSafe, State of Vermont (May 1, 2012)
- 7.3. Greg Coates, Architect, New London, New Hampshire (Several Visits over March and April)
- 7.4. Calvin Hunnewell, Director of the Codes Department, Lebanon, New Hampshire (Several visits over March and April.)
- 7.5. All inspections were accompanied by Mink Brook Management representative, Leet Ware.

## 8. Photos



Photograph No. 1: Stairway going to 2<sup>nd</sup> level of DPW that needs mid-rail at the least.

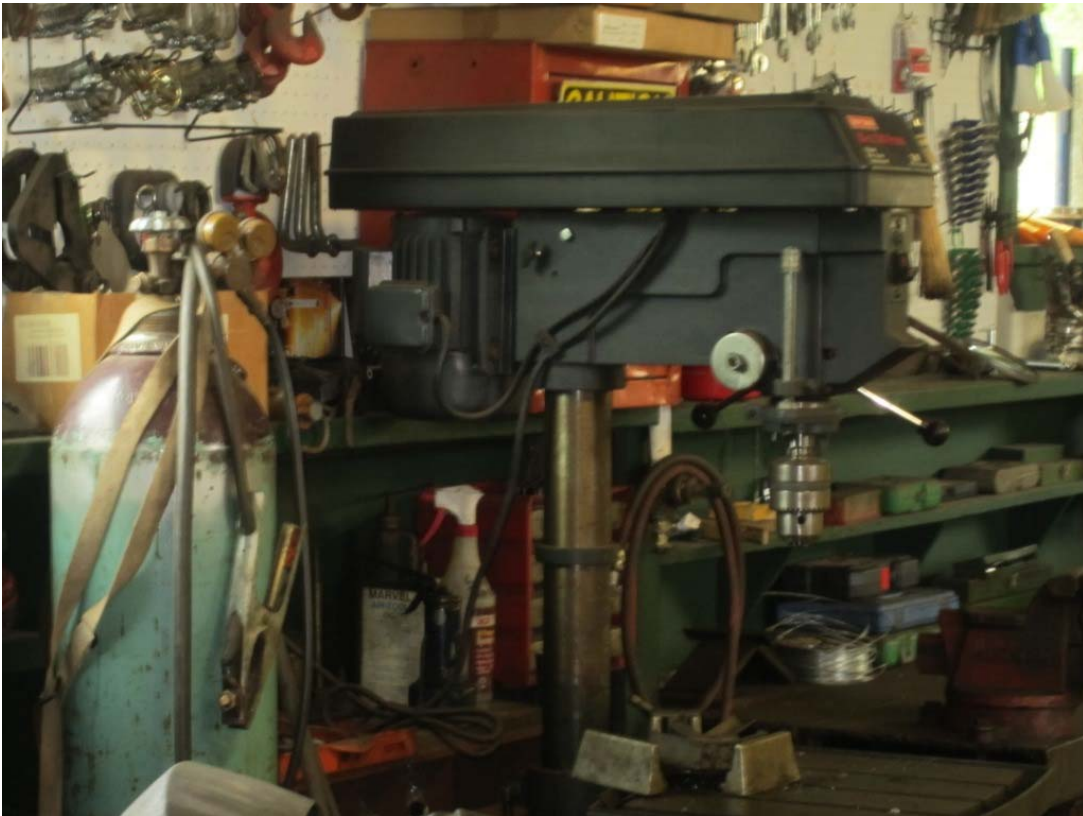


Photograph No. 2: Highly flammable acetylene tank storage.





Photograph No. 3: More flammable fuel oil storage in bulk in the main DPW maintenance shop.



Photograph No. 4: Flammable storage with equipment.





Photograph No. 5: More of the stairway to the 2<sup>nd</sup> level that needs mid-rail.



Photograph No. 6: Flammable cabinets, several throughout the shop.



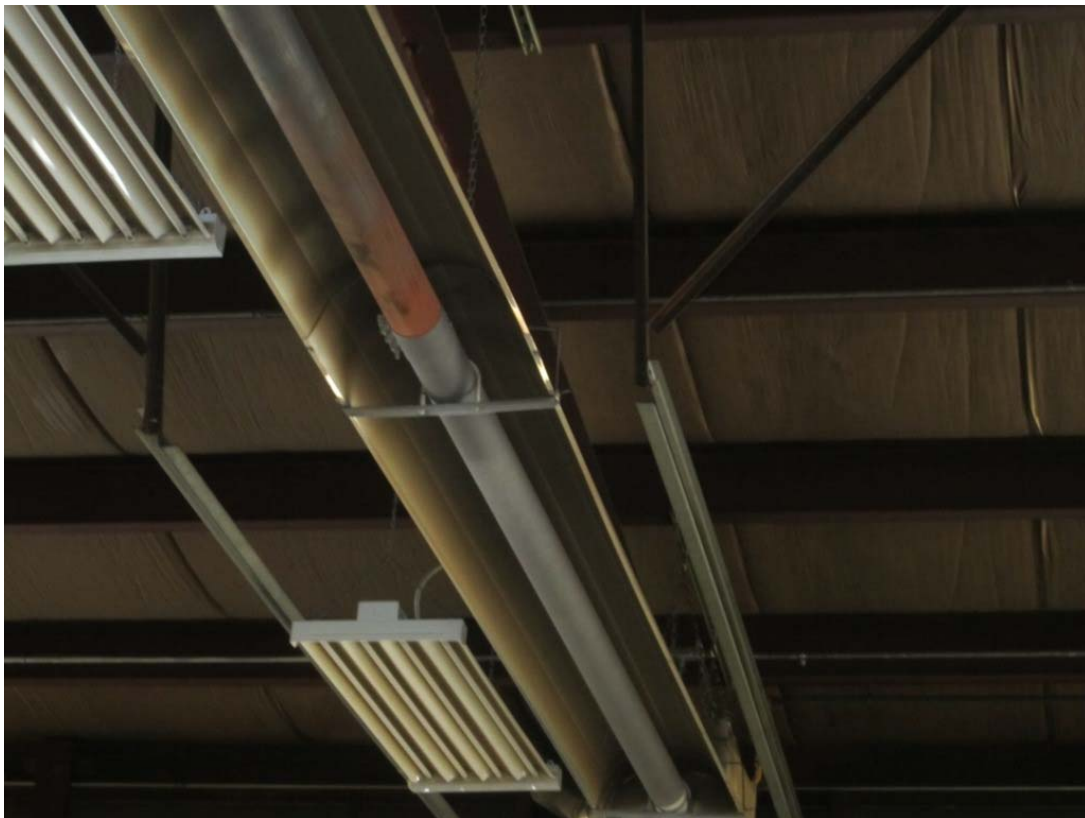
Photograph No. 7: Continuous floor grate for floor drain.



Photograph No. 8: Flammable liquid containers stored in maintenance garage.



Photograph No. 9: More Flammable cabinets and oversized step up into generator room.



Photograph No. 10: Heat piping for convection style heat system.





Photograph No. 11: Standard metal building insulation soaked by leaking roof.



Photograph No. 12: Generator



Photograph No. 13: Small open storage room.



Photograph No. 14: Existing bathroom and eyewash station.





Photograph No. 15: Oily rag container.



Photograph No. 16: Exterior of the existing building with solar panels.



Photograph No. 17: Exterior of the existing building with solar panels.



Photograph No. 18: Exterior of the existing building with solar panels.





Photograph No. 19: Exterior of the existing building with solar panels.



Photograph No. 20: Continuous floor drain grate to nowhere.

## 9. Site

- 9.1. There is sufficient space on the site to accommodate an addition to the building and other storage and function buildings.

## 10. Appendix B Underground Injection Control (UIC) Program

Registration is now required of all 5W20 and 5X28 (industrial, commercial, utility, and automotive) floor drain/injection well systems used for the disposal of fluid waste. Some of the information that the UIC Program will obtain from registration includes ownership and location of floor drain/injection well systems, types, and amounts of wastewaters being disposed to the floor drain/injection well system, and the type of business where floor drain/injection well systems exist. There will be no fee for registration. Registrations will remain valid for the life of the floor drain/injection well system unless there is a change in the information provided to the UIC Program in the original registration form.

### Recommended/Prioritized Alternatives to Floor Drain/Injection Well Use

1. Eliminate the floor drain. Some facilities report to the UIC Program that despite the existence of the floor drain/injection well system, there is no appreciable discharge. When this is the case, the DEC recommends that floor drains be closed and sealed. All closures should be reported to the UIC Program.
2. Reroute the floor drain to discharge to a municipal sewer line, where available and where acceptable to the municipality, or discharge to a facility accepting the generated wastewater. When wastewaters are generated, the DEC considers this option to be the best available technology.
3. Collect wastewater in a storage tank and dispose of via a local wastewater treatment plant or a hazardous waste hauler as appropriate. You must first determine if the wastewater is a hazardous waste before collection into storage tank. If the wastewater is determined to be a hazardous waste, you may need a permit from the Hazardous Materials Management Division. Guidance may be sought from the Hazardous Materials Management Division.
4. Reroute the floor drain to daylight. Approval must be obtained from the Permits, Compliance, and Protection Division.

### UIC Program Permits for Floor Drain/Injection Well Systems

Individual UIC permits are required for 5W20 and 5X28 floor drain/injection well systems. The schedule under which this permit requirement will be enforced is listed in the “Strategy for Implementation” section of the procedure. Individual UIC Permits require submittal of applications and fees. The discharges to 5W20 and 5X28 floor drain/injection well systems are generally considered to pose a contamination risk to groundwater. The permits issued will have conditions to protect groundwater quality.

Some floor drain/injection well systems create too high a risk to qualify for Individual UIC permits. These may include 5X28 floor drain/injections wells that receive waste from floor drains in areas where vehicle maintenance is performed or where hazardous materials and/or hazardous waste is stored or used. Other floor drain/injection well systems may be considered too high a risk if the UIC Program has evidence to suspect a violation of primary drinking water

or groundwater quality standards caused by the was injection. Such floor drain/injection well systems will not qualify for Individual UIC permits and must be closed.



## 11. .. Appendix C Roof Proposal

Public Works Building-

New membrane roof with flute filler and 2 inch Iso over entire area \$38,000.00-\$42,000.00.

Please let me know if you have any questions. Thank you.

Sincerely,

Dana Geno



P.O. Box 128/101 Commerce Park

Sharon, VT 05065

802-295-5604 p

Other roof expenses will include assessment by structural engineer...\$1,000.00

Remediation based on engineer's report is unknown.

## 12. Appendix D: Exhaust System Quote

**J & G Industrial Installation, Inc.**  
**54 Old Dock Road, Suite C**  
**Yaphank, NY 11980**  
**Phone (631) 924-6161 Fax (631) 924-8247**

Town of Norwich  
300 Main Street  
PO Box 376  
Norwich, VT 05055

November 13, 2008

Attn. Town Manager

Re: Revised Proposal for Nederman Vehicle Exhaust System @ Public Works Building

Gentleman,

We are pleased to submit at this time the following quotation for the above referenced project. The equipment we are proposing to install is the 865 Model 50 Wide Body Hose Reel System as manufactured by Nederman, Inc. of Westland Michigan.

All work to be performed as briefly described below.

### **DPW Area**

Furnish and install all labor, material and equipment necessary to install one (1) 865 Model 50 Wide Body Hose Reel System to cover the maintenance area in the above referenced facility.

### **Major Equipment to be Furnished**

One	(1)	865 Model 50 Wide Body Hose Reel	Part# 20807465
One	(1)	NS Silicone Hose, 6" x 24' Hose	Part # 006624
One	(1)	Round Rubber Nozzle, 6"	Part # 20803361
One	(1)	5 HP/3 PH DD Blower 3200 CFM @ 4" S.P.	Part# NIF 403-3
One	(1)	Motor Control Station	Part# ASCS-5-1
One	(1)	Exhaust Cane for Top Exhaust	Part # 20801961

### **Installation Requirements**

Furnish and install all materials necessary to install and properly support one (1) Exhaust Hose Reel System in its entirety. System shall be hung approximately 14'0" above the finished floor.

Furnish and install all labor and material necessary to install one (1) 5 HP/3 PH Direct Drive Blower onto the exterior wall of the facility. Fan is to be sized for the possibility of future expansion.

Furnish and install all duct work as required for a complete and functional system. All connections shall be screwed and silicone sealed for an airtight seal.

Furnish and install a high velocity no-loss stack head to the output of the blower unit. The exhaust stack shall terminate approximately 3' above the roofline. The stack head we propose is in accordance with the American Conference of Governmental Industrial Hygienists.

Furnish and install all electrical work as required for a complete and functional system. Installation is to include a three-phase motor that is driven by a frequency drive control panel. This panel will accept the single-phase input from the building and generate the three-phase output required by the motor. This panel will also have the ability to lower the fan motor speed to accommodate the one (1) hose reel. If future expansion is desired, the control panel can increase the fan motor speed to provide the required suction at no additional cost.

We propose to install galvanized enclosure over the blower unit to keep inclement weather directly off the unit, in addition to further reducing noise levels, which are already below E.P.A. standards..

**Total for DPW Area.....\$9,985.00**

We hope to be of service to you and your organization in the near future. If you have any questions or require any additional information, please do not hesitate to contact us.

Respectfully,

Jim Wischhusen  
President, J & G Industrial Installation, Inc.

