

***TOWN OF NORWICH  
OFFICE OF THE TOWN MANAGER  
P.O. Box 376, Norwich, VT 05055  
(802) 649-1419 Ext. 101 or 102***

## ***MEETING NOTICE***

***THERE WILL BE A SPECIAL MEETING OF  
THE NORWICH SELECTBOARD***

**Date: Thursday, December 17, 2015**

**Time: 6:30 PM**

**Place: Multipurpose Room, Tracy Hall**

### **Agenda**

- 1) FEMA Alternate Projects Review (Discussion/Possible Action Item)**



# FEMA

## DISASTER ASSISTANCE POLICY

### I. TITLE: **Alternate Projects**

II. DATE: AUG 22 2008

### III. PURPOSE:

This policy provides guidance on allowable uses and limitations of alternate project funds when restoration of the original damaged facility is not in the best interest of the public.

### IV. SCOPE AND AUDIENCE:

The policy is applicable to all major disasters declared on or after the date of publication of this policy. It is intended for personnel involved in the administration of the Public Assistance Program.

### V. AUTHORITY:

Section 406(c) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5172(c), and 44 Code of Federal Regulations (CFR) §206.203(d), 44 CFR §206.204, and 44 CFR §206.226.

### VI. BACKGROUND:

When an applicant determines that the public welfare would not be best served by restoring a damaged facility or its function, the applicant may request approval of an alternate project from FEMA through the Grantee. Applicants receive Federal funding based on a percentage of the Federal cost share of the Federal estimate of the cost of repairing, restoring, reconstructing, or replacing the facility. Section 609 of the Security and Accountability For Every Port Act of 2006 (SAFE) (P.L. 109-347) amended section 406 (c)(1) of the Stafford Act by changing the contribution for alternate projects for public facilities from 75 to 90 percent of the Federal share of the eligible costs. 42 U.S.C. 406(c)(1)(A). There was no change to the contribution of 75 percent of the Federal share for alternate projects for Private Non-Profit facilities. 42 U.S.C. 406(c)(2)(A).

An "alternate project" is different from an "improved project." An improved project restores the facility and maintains its function or maintains the function in another existing or new facility. See 44 CFR 206.203(d)(1). Conversely, the application of eligible funding to repair or expand other public facilities, or construct a new-use facility, or purchase capital equipment or perform hazard mitigation measures unrelated to the original facility, would be considered



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alternate projects. Section 206.203(d)(2) of Title 44 CFR describes the basic requirements for alternate projects. This policy discusses applications of the regulation.

### VII. POLICY:

The following policy guidelines provide detail on alternate project funding uses and limitations.

A. The applicant may request approval of an alternate project from FEMA through the Grantee when an applicant determines that the public welfare would not be best served by either restoring a damaged facility or by restoring the function of a damaged facility. Either one of the two conditions must be met. See 44 CFR 206.203(d)(2).

B. The proposed alternate project must be a permanent project that benefits the general public. See 44 CFR 206.203(d)(2).

C. A damaged facility whose repair costs were used for an approved alternate project may be eligible for future Public Assistance funding provided that the Applicant funded and performed the repairs to the original damaged facility.

D. Funds may be used to repair or expand other selected facilities, to construct new facilities, purchase equipment, or to fund hazard mitigation measures in accordance with other provisions of this policy.

E. FEMA expects the proposed alternate project to serve the same general area that was being served by the originally funded project.

F. The FEMA Regional Administrator must approve all alternate projects prior to the start of construction. See 44 CFR 206.203(d)(2)(v).

G. The proposal must include a description of the project, including the project location, an estimate of costs, a schedule of work, including a starting date for work, and a targeted completion date, and the necessary assurances to document compliance with special requirements, including, but not limited to floodplain management, environmental review, hazard mitigation, protection of wetlands, and insurance. 44 CFR 206.203(d)(2)(v). Historic and any other legal considerations should also be identified. The applicant should identify the source of funding for projects when the cost estimate for the alternate project is greater than the eligible alternate project funding.





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H. Alternate projects must be completed based on existing regulatory time frames established in 44 CFR 206.204. The Region can approve time extensions under extenuating circumstances.

I. Funding for alternate projects:

1. Public facilities. Eligible costs for Public facilities are 90% of the approved Federal share of the project estimate of eligible repair/replacement costs of the damaged facility or the actual fixed cost of completing the alternate project(s), whichever is less. The appropriate Federal cost share will then be applied to the lesser amount.

Basic Calculation:

\$100,000 – Project Estimate of Eligible Damage

\_\_\_\_\_ x.75 – % of Federal Cost Share

\$ 75,000 – New Project Amount

\_\_\_\_\_ x.90 – of Federal Cost Share

\$ 67,500 – Maximum Grant Amount

Applicant must spend at least \$75,000 on the approved alternate project to receive \$67,500. The Federal grant is capped at this amount.

If the applicant spends less than the new project amount, then the Federal cost share would be 75% of the actual amount spent.

2. Private non-profit facilities (PNP). Eligible costs for PNPs are 75% of the approved Federal share of the project estimate of eligible repair/replacement costs of the damaged facility or the actual fixed cost of completing the alternate project(s), whichever is less. The appropriate Federal share will then be applied to the lesser amount.

Basic Calculation:

\$100,000 – Project Estimate of Eligible Damage

\_\_\_\_\_ x.75 – % of Federal Cost Share

\$ 75,000 – New Project Amount

\_\_\_\_\_ x.75 – of Federal Cost Share

\$ 56,250 – Maximum Grant Amount

Applicant must spend at least \$75,000 on the approved alternate project to receive \$56,250. The Federal grant is capped at this amount.

If the applicant spends less than the new project amount, then the Federal cost share would be 75% of the actual amount spent.



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In both cases, the eligible repair/replacement costs include the costs of meeting the requirements of 44 CFR 206.226. Projects must also meet the basic requirements outlined in 44 CFR 206.203(d)(2).

**J. Mitigation Projects:** The types of mitigation projects that may be approved for alternate project funds are very broad. The following guidelines are provided:

1. Mitigation measures may mitigate potential damages to a facility that would be eligible for funding under section 406 of the Stafford Act. However, the funding cannot duplicate any other mitigation funding.
2. Mitigation measures may be of the same type as would be eligible for funding under section 404 of the Stafford Act (the Hazard Mitigation Grant Program), if they meet a need for:
  - a. Governmental services and functions in the area affected by the major disaster, in the case of government applicants, (Stafford Act, section 406(c)(1)(B)(iii)), or
  - b. Eligible PNP's services and functions in the area affected by the major disaster (Stafford Act, section 406(c)(2)(B)(iii)).
3. The mitigation measure does not have to mitigate the same type of damage that was caused by the disaster and does not have to be for the same type of disaster.

**K. Multiple Use of the Funds:** Alternate project funds from a single project do not have to be used on a single project. Alternate project funds from multiple projects may be pooled or divided.

1. Alternate project funds can be divided and used on multiple projects to repair, expand, mitigate, or construct a facility that would be an eligible facility under the Public Assistance Program. (Stafford Act, section 406(c)(1)(B), (2)(B)).
2. Alternate project funds may be used across all permanent work categories (such as expanding an existing building or replacing a sewer line). Some potentially eligible examples include:
  - a. Upgrading a substandard undamaged road that is subject to repeated flooding, in order to better serve the general public and reduce the repetitive flood damage.
  - b. Upgrading a facility to mitigate future disaster damage whether or not the facility was damaged by the event. Upgrades might range from something as simple as hurricane clips or bracing, to a large project.





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c. Relocating, as a mitigation measure, undamaged facilities such as roads and utilities that are subject to repetitive damage.

d. Demolishing an outdated maintenance building (non-emergency work) and using the funds to construct a new water treatment plant at the same location.

e. Abandoning a county bridge and using the funds to build a new county maintenance shop.

f. Increasing the capacity of a new building. For example, adding a wing to an existing building being repaired.

g. Using funds eligible to repair a transportation administration building to acquire and renovate a building to serve as a school for the arts.

h. Purchasing pieces of equipment (such as scientific equipment, telecommunications switches, fire trucks, vehicles, etc.) that exceed \$5,000 per unit, and have a useful life of a year or more.

L. Insurance must be obtained and maintained on vehicles, buildings and building contents in an amount equal to the alternate project funding. See 44 CFR 206.203(d)(2)(v).

M. In accordance with applicable standards of safety, a facility that is not repaired, replaced, or sold must be rendered safe and secure or demolished.  
See 44 CFR Part 206, Subpart M.

N. Limitations: Ineligible Uses of Alternate Funds:

1. Repayment of debts.
2. Meeting budget shortfalls.
3. Creating a new community plan that extends beyond the alternate project building (e.g., a new master plan for a school, university, or hospital campus).
4. Landscaping projects.
5. The purchase of supplies, furniture, and equipment costing less than \$5,000 per unit (considered an operating expense).



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6. The funds may not be used to pay the non-federal share of any project, nor any operating expenses. See 44 CFR 206.203(d)(2)(v).

7. Construction of a facility that would not be eligible for Public Assistance Program funding in a subsequent disaster.

8. Buy-outs ( i.e., acquisition of property for open space as a mitigation measure).

O. The value, or anticipated fair market value, of salvaged materials from the original facility (less the estimated costs necessary to demolish the facility, grade the site, or make the facility safe and secure) should be an adjustment on the Project Worksheet (PW) that has been written for the repair of the original project. Regardless of what the applicant decides to do with the original project after accepting the alternate funding option, the salvage issue should be resolved in the original PW.

P. Alternate Projects must satisfy compliance review requirements as established by 44 CFR Parts 9 and 10 and all other applicable Federal environmental and historic preservation requirements. In accordance with Section VII of this policy, an applicant must ensure that the original damaged facility does not create an imminent and substantial endangerment to human health or the environment like causing the release of hazardous pollutants or becoming a hazard to human health, safety and welfare in a future flooding event. The decision of the applicant regarding the future status of the original facility, including abandonment or applicant-funded demolition, is not a major Federal action under the National Environmental Policy Act (NEPA), an undertaking under Section 106 of National Historic Preservation Act (NHPA), or a Federal action under the Section 7 Interagency Coordination requirements of the Endangered Species Act (ESA) and does not require independent environmental and historic preservation compliance review by FEMA. However, the applicant is legally and financially responsible for compliance with any other applicable Federal, State, Tribal, or local requirements, including responding to and mitigating for releases of hazardous pollutants.

Q. The proposed alternate project is subject to FEMA environmental and historic preservation review. FEMA will be responsible for the administrative costs for conducting the environmental and historic preservation review and assessments. The applicant will be responsible for the costs of implementing any mitigation/treatment measures or costs associated with the alternate project at the new site.

R. The applicant must provide FEMA any information concerning the planned action(s) for the original site as soon as such plans are available. In the event that plans for the original site are available and reasonably likely to be implemented FEMA may require the applicant to





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consult with agencies including the State Historic Preservation Officer or Tribal Historic Preservation Officer (SHPO/THPO), Fish and Wildlife Service, National Marine Fisheries, or U.S. Army Corps of Engineers as condition for the approval of the alternate project to identify if the planned action will adversely affect a protected historic or environmental resource. The applicant must consider the agency's recommended measures to avoid, minimize, treat, or otherwise address any adverse impacts to the identified resource. The applicant will be responsible for all costs associated with implementing these measures.

S. Any action of the applicant using FEMA funds at the original site, such as demolition, is an undertaking under Section 106 of NHPA, a major Federal action under NEPA, and a Federal action under the Section 7 Interagency Coordination requirements of ESA and requires FEMA's environmental and historic preservation review before it can begin. FEMA may evaluate the alternate project and the action at the original site separately if they have independent utility, the approval of one action does not foreclose alternatives for the other, and the approval of one action does not justify or commit FEMA to the other action.

**VIII. RESPONSIBLE OFFICE:** Disaster Assistance Directorate (Public Assistance Division).

**IX. SUPERSESSION:** This policy supersedes Recovery Policy 9525.13, Alternate Projects, published July 31, 2001 and any other previous guidance on this subject.

**X. REVIEW DATE:** Three years from date of publication.

Carlos J. Castillo  
Assistant Administrator  
Disaster Assistance Directorate



# FEMA Alternate Projects

Project Description	First Cost	Match of FEMA	Source of Match	Town First Cost	Annual Costs	Notes
Charles Brown Brook Restoration	\$100,000	\$14,000	Town Appropriation	\$14,000	\$0	
Huntley Meadows Restroom and Concession Facilities	\$160,000	\$22,400	Recreation Reserve Fund	\$22,400	\$10,000	Annual cost does not including staffing of concession stand and supplies. Assumes cleaning the facility 3 time per week for 6 months of the year.
Police Department Garage	\$90,000	\$12,600	New Town Appropriation	\$12,600	?	
Public Safety Facility Upgrades	\$1,750,000	\$56,000	Bonds	\$1,406,000	\$11,375	
Public Works Facility Upgrade	\$750,000	\$56,000	Bonds	\$406,000	?	
Route 132 Culvert Replacement	\$125,000	\$17,500	Bridge Reserve Fund	\$17,500	\$0	

Notes: Assumes \$400,000 available  
Projects are not additive

FEMA Alternate Project Request

RECREATION

Project Name

Huntley Meadow Enhancement

Description including Time to Complete Project

Permanent building with 2-3 restrooms. A concession stand and water fountain are recommended to be included.  
Approximately 5 months to complete project

Benefit to Norwich

Replacing porto-potties with a permanent restroom structure would significantly improve our Huntley meadow facility, providing a pleasant, hygienic experience. Moving to a permanent system has been suggested by many residents.

First Cost and Source of Match

\* \$160,000 / \$32,000 from Recreation Facilities Improvement Fund

\* An additional \$60,000 would provide a more long-term version (larger) but I don't yet have a match.

Annual Operating Cost and Source

Minor electrical, water and custodial costs \$1,500/year approx. - Would eliminate portapotty rental

Minor maintenance/upkeep after 5-10 years could hopefully become part of B+G

Life of Project

50 years

Other Information - Also a verbal guesstimate bid of \$150,000 was given by Brian Gardner.

I have researched this with the 'Public Restroom Company' and 'CXT' and can provide you with detailed information. See attached photos for a template. Phil said Huntley soil is excellent for supporting this project.

Submitted By:

Jill K. Niles

Date

12-4-15









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# DESIGNING WITH FOUR SEASONS IN MIND *(ours would be smaller)*

## KEEPING RESTROOMS OPEN YEAR ROUND

Public Restroom Company has the flexibility to design restrooms that can accommodate any season. If you have a park with partial winter usage needs, the balance of a restroom can be drained for winter, and the family room can be freeze protected for all season use. If you have a setting that has high usage in the summer and needs multiple fixtures, and during the winter months only the minimum number of fixtures needs to be operable, we can utilize a floor plan where all but one family restroom is closed and winterized during the winter months. PRC designs buildings adapted for winter climate locations which include; quick draining water lines, trap plugs for drains, waste and vent drainage, Lexan® vent covers, and radiant heating systems. Spring maintenance is easier due to our planning and design.

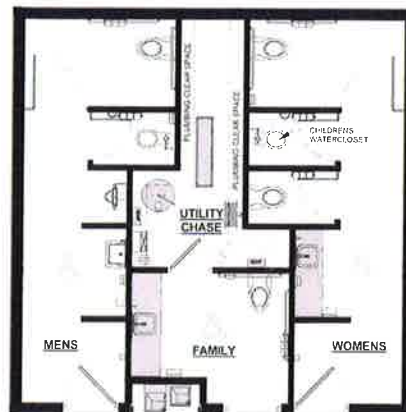
## WINTERIZING PARK RESTROOMS

The number one challenge in winterizing restrooms is the floor drains. At times they will accumulate moisture during the winter season causing damage as the moisture freezes and expands. Public Restroom Company has solved this problem by including accessible, removable



FAMILY  
RESTROOM

floor drain traps located within the utility chase. Once the trap is removed the staff places a cap on the street side of the trap to prevent odors. PRC provides customized owner's manuals with a step-by-step winterization section for every standard and optional component including; floor drains, main piping, water line fittings, fixtures and faucets, and hose bibs.



IN-FLOOR RADIANT  
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YEAR ROUND  
NATURE  
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READER SERVICE #301





## FEMA Alternate Project Request

### Project Name

Public Safety Facility

### Description including Time to Complete Project

Removal of current Police Department building and the construction of an approximately 6500 square foot Public Safety Facility that will house the police department and all of its functions, administrative offices for the Fire Department and shared spaces such as training room and EOC, *using space needs and program previously approved by the Select Board*. Completion of project 9 Months from start date. This project economizes construction costs by creating shared spaces for the Police and Fire Departments.

### Benefits to Norwich

A new police facility will be more than a tool to increase staff efficiency; it will provide a wide range of new opportunities for both the public and the staff of the Norwich Police Department. It will provide infrastructure that will be needed in the decades to come. A new, properly designed police facility also will enhance the ability to attract and retain quality staff and it will serve the village during natural disasters and public emergencies. A new building will provide a new (shared training room), additional bathrooms with showers, and will mitigate some of the storage issues in the Firehouse. The training room will be available for public use while still maintaining security. A dual-purpose conference room will be available for use as an Emergency Operations Center during major incidents.

### First Cost and Source of Match

Estimated Cost of project:      \$1,750,000  
   - 324,000 FEMA funding (400,000 X .9 X .9)  
   **\$1,426,000**  
Funding and Match would be a Bond

### Annual Operating Cost and Source

Industry standard for operating cost is \$1.75 per square foot, a 6500 sq ft office building would be approximately \$11,375 per year. This figure could be offset by renewable energy, and may be lower with proper and regular maintenance of the building.

### Life of Project

50 plus years

### Other Information

The current Police Department office was built as a private residence in 1957. When the police department moved before the Tracy Hall renovations the move was envisioned as a relatively short term of 5 to 10 years. The plywood sheathed ranch style house on a slab was never designed to house the complex requirements of a modern Police department and with minimal maintenance over the past 25 years, the building has structural, insect, and rodent problems not considering the code deficiencies found during inspections. The building has many maintenance problems that have been deferred over the years and has accessibility limitations.

Problems with the current facility include continual leaking roof areas, lack of insulation in the walls and above the ceiling, outdated materials used for the construction that do not meet standards today for ceiling tile, flame spreads, and fireproof characteristics. The exterior of the building needs lots of attention. The building is in dire need of paint, and renovation repairs. The existing garage area and furnace room have many code problems and the existing rooms used for offices and storage are inadequate spaces without room for expansion. The kitchen and bathroom / locker room facilities are not ADA compliant; this just mentions a few of the issues with the current facility.

Whether revitalization or replaced any police facility needs to be easy to find, provide adequate public parking, secure staff parking and convey a sense of Norwich's rich history.

The current firehouse is overcrowded and lacks basic facilities. There is only one bathroom and no shower. The training room is too small and serves as a kitchen. The sidewalls and spaces between apparatus are crowded with storage. Fire hose is washed and dried on the apparatus floor which creates tripping hazards. There is no way to restrict access when outside groups use the training room.

Submitted By: Doug Robinson and Steve Leinoff Date December 4, 2015  
*Electronically signed*



## FEMA Alternate Project Request

### Project Name

PD Garage

### Description including Time to Complete Project

Construction of a 48 X 24, approximately 1200 square foot four bay secure garage that the cruisers can be parked in during off hours. 2x6 construction on 16" centers, The floor is made to house heavy vehicles and a 8" poured pad with rebar to prevent cracking, the garage has an electrical panel and the building is wired with electrical outlets. It has 6 windows with custom security bars for each window, 2 that can be opened. The roof is metal. The lighting will be overhead lighting above each bay. The garage doors will be standard size 9' wide X 7' high, and two standard exterior doors on each end for access. Estimated time to complete project: 120 days from start to completion.

Norwich Officers are on call for several hours during the early morning hours. Officers are called at home to respond to incidents that require police presence. During inclement weather, especially during winter months officer's response time is delayed because that have to scrape ice off the windshield, or brush snow off before the vehicle can be operated. During shift officers routinely keep their cruisers running during inclement weather so that they will not have to brush snow or scrape ice before responding to an emergency call. By keeping the cruisers inside will dramatically reduce response time as well as reduce fuel consumption as they will be able to shut the cruiser off.

### Benefit to Norwich

### First Cost and Source of Match

Estimated cost: Excavation and site work	\$25 per foot X 1200 FT = \$30,000
Material and construction	\$50 per foot X 1200 FT = <u>\$60,000</u>
	\$90,000
	X .75
	<u>\$67,500</u>
	X .90
	<b>\$60,500</b>

Source of match is to tap into the undesignated funds.

### Annual Operating Cost and Source

The garage is not heated and electricity would be the only additional operating cost which could be absorbed into the budget as well as the routine maintenance which would be minimal.

### Life of Project

35 plus years

### Other Information

Secure garage would also be used for larger items of evidentiary value to be able to maintain a chain of custody. Garage should be built in a location so as it will be useable and not interfere with the removal of the current public safety facility and the construction of a new facility.

Submitted By: *Douglas A. Robinson* Chief of Police      Date 12/4/2015  
Electronically Signed

## FEMA Alternate Project Request

### Project Name

Upgrades to Public Works Facility

### Description including Time to Complete Project

As proposed in the attached specifications dated August 28, 2015  
Time to complete the project: 6-12 months.

### Benefit to Norwich

The Public Works facilities would be more energy efficient.  
There would be ample cold and warm storage space for all Public Works trucks and equipment.  
Plans include an oil separator.  
There would be adequate office, restroom, and break room facilities for Public Works employees.

### First Cost and Source of Match

Between \$600,000 and \$700,000.  
Match funding would come from a bond vote.

### Annual Operating Cost and Source

### Life of Project

50 Years

### Other Information

Submitted By: R. Andrew Hodgdon, Norwich Public Works Director    Date: December 1, 2015



**Outline Specification  
for  
Public Works Buildings Budgetary Estimate  
Town of Norwich, Vermont**

**1. Building 1 - A pre-engineered steel metal building for the Norwich Public Works Department that meets the Vermont building and energy codes**

1.1 New Building (See attached conceptual drawing.)

1.1.1 70' deep by 100' long.

1.1.2 Clear height of a minimum of 14'

1.1.3 Five bays with 14' wide by 14' high insulated sectional garage doors with windows.

1.1.4 Concrete floor with trench floor drain and oil separator connected to a 10,000 gallon pump out tank provided as part of the project.

1.2 Roof

1.2.1 Gable with a 4:12 slope

1.2.2 Metal panels with vapor barrier, concealed fasteners and Galvalum coating

1.3 Walls

1.6.2 Metal panels with vapor barrier, concealed fasteners and Galvalum coating

1.4 Electrical

1.4.1 The electric supply shall be connected to the existing transfer switch adjacent to the existing public works garage

1.4.2 In addition to the outlets required by the NEC there shall two 220 volt 90 amp outlets at the following locations:

1.4.2.1 Right side of the first column from the left at the rear wall

1.4.2.2 Right side of the first column from the left at the front wall

1.4.3 Lighting

1.4.3.1 High efficiency T5 fixtures.

1.5 Heating

1.5.1 Garage area heated by propane radiant tube heaters.

1.5.2 Office, restroom and break room heated by propane forced hot air heat with air conditioning. A setback thermostat to be located in the office.

1.6 Plumbing

1.6.1 Water – connection to proposed non-potable well that will be extended to within 10' of the wall of the building nearest to the proposed well location by owner. The well location is next to the underground tank with the dry hydrant.

1.6.2 Move the existing solar hot water tank, system and solar panels from the existing building to the new building mezzanine and supplement the solar system with a 199,000 BTU per hour propane tankless water heater. If it would be more cost effective the existing Navien model #CC240A could be relocated. (Needs to change if PV is on roof.)

1.6.3 One hot and cold water spigot at the front of the building between bays three and four. Not

to be buried in floor.

1.6.4 Septic - Connect to the existing mound system manhole located near the left rear corner of the proposed building.

#### 1.7 Ventilation

1.7.1 Sufficient ventilation to control humidity and condensation on interior of exterior wall and roof surfaces.

1.7.2 6,000 cfm exhaust fan mounted in rear wall of the bay furthest from the office.

#### 1.8 Building Finishes

1.8.1 The garage area shall be exposed structural members.

1.8.2 The office/break room area shall have typical interior finishes including commercial grade vinyl floor tiles and base. The wall between office areas and the garage shall be on 2" x 6" studs with sound insulation and sound insulation shall be installed between the rafters supporting the mezzanine floor.

#### 1.9 Alternates (Please estimate costs separately)

1.9.1 Add one 20' wide bay with garage door and expand building to 70' x 120'

1.9.2 Reduce the size of the building to 40' x 100'

1.9.3 Add a partition that separates the bay furthest from the office so it can be used for spray painting

1.9.4 Upgrade roof and walls to insulated metal panels

1.9.5 Add a rail mounted vehicle exhaust system with two reels suitable for horizontal and vertical gasoline and diesel car, truck and construction equipment in the bay furthest from the office.

1.9.6 Add a fire sprinkler system meeting the requirements of NFPA 13

1.9.7 Change from a 4:12 gable roof to a 2:12 shed roof for mounting solar panels

### **2. Building 2 – An unheated expansion of the existing building (Please estimate costs separately)**

2.1 Replace the roof on the existing building

2.2 An engineering report (copy attached) of the existing building stated that:

The lateral load resisting elements (braces, moment frames, etc) of the existing building were not visible in the sidewalls and the back wall during the site visit. The only wall where evidence of a lateral load resisting system was noted was the in the front wall, where a moment frame was located in one of the overhead door bays. Code requirements for existing buildings specify that if the loads to the lateral resisting systems of existing buildings increase by more than 10%, the entire lateral system must be upgraded to current code requirements. For this building, we have determined that a net dead load increase of 1.5 PSF is allowable without a full analysis/upgrade of the lateral load resisting systems.

2.2.1 At some time in the past an X brace(s) that was the lateral resisting system was removed

from the rear wall of the existing building. Recommend and include in the cost estimate providing a lateral resisting system in the rear wall possibly similar to the moment frame at the front of the building.

2.3 Add a new overhead door that matches the existing doors in the right bay when facing the front of the building.

2.4 Add a 40' x 100' addition to the back of the existing building. The new roof at the point it attaches to the existing building shall be located at least 2' below the existing roof.



**Public Works Program**

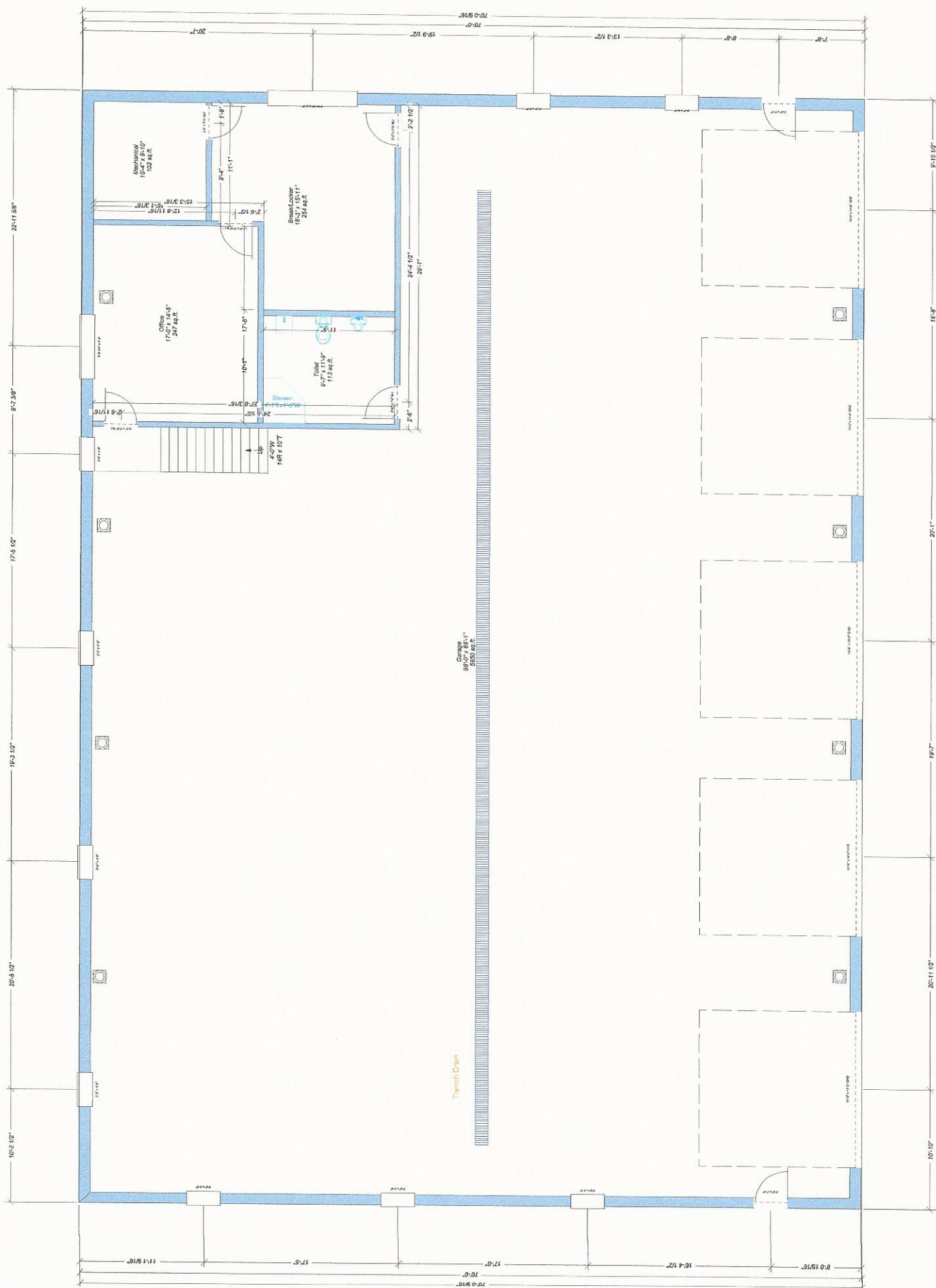
<b>Program Spaces</b>	<b>Existing</b>	<b>Proposed</b>	<b>Plan</b>	<b>Remarks</b>
Heated Equipment Storage	3,520	5,120	4,450	Storage of winter maintenance equipment (See List) Possible solar on roof
Maintenance Bay	0	1,280	1,400	Provides one bay for maintenance and painting of equipment including fire and police
Employee Break Room/Locker Room/Conference Room	65	280	254	Break/locker room for employees isolated from garage
Directors Office	50	200	247	Secure private office for Director isolated from garage
Toilet with Shower	52	100	113	Toilet and shower room for employees with eyewash facility
Parts Storage	48	150	0	Storage for parts for vehicle and equipment maintenance activities
Mechanical Room	0	100	102	HVAC for office, break room and restroom, electrical and alarm panels.
Flammable Liquid and Gases Storage Room	50	200	0	Protected storage for flammable liquids, greases and gases
General Storage	630	650	0	Mezzanine (716 SF) General storage of public works supplies
<b>Total Heated</b>	<b>4,415</b>	<b>8,080</b>	<b>6,566</b>	7,966 SF with an additional bay
Unheated Equipment Storage	0	6,000	8,080	Storage of non-winter maintenance equipment (See list)
<b>Total with Unheated Storage</b>	<b>8,830</b>	<b>14,080</b>	<b>14,646</b>	

**Heated Equipment Storage**

- 4 - Freightliner Plow Trucks with Plow and Wings
- 1 - Chevrolet Plow Truck with Plow and Wing
- 1 - Ford Plow Truck with Plow and Wing
- 1 - Ford Plow Truck with Plow
- 1 - Sidewalk Plow with Plow and Blower
- 1 - Loader with Bucket and Plow
- 1 - Snow Blower for Loader

**Unheated Equipment Storage**

- 1 - Backhoe/Loader
- 1 - Ford L900 Truck for Dust Control
- 2 - Graders
- 1 - B&G Truck
- 1 - Utility/Maintenance Truck with Welder
- 1 - Landscape Trailer
- 1 - Wood Chipper
- 2 - Roadside Mowers
- 2 - B&G Mowers
- 1 - Light Tower
- 1 - Pressure Washer
- 1 - B&G Trailer
- 1 - Highway Equipment Trailer
- 1 - B&G Tractor with Accessories
- 1 - Air Compressor





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November 11, 2014

Neil Fulton, Town Manager  
Town of Norwich, VT  
P.O. Box 376  
Norwich, VT 05055

Subject: **DPW Building Analysis**  
**New Boston Road, Norwich, VT**

Dear Neil:

As requested, on October 14, 2014, I visited the above referenced site to review the existing roof structure in order to determine the existing load capacity and the structural acceptability of adding new insulated roof panels.

Our analysis and review of the building are based upon the requirements of the 2012 Vermont Fire and Building Safety Code which incorporates the 2012 International Building Code. According to the Vermont Fire Building and Safety Code, the on ground snow load for Norwich, Vermont is 50 pounds per square foot (psf). In our analysis we factored the snow loads to account for exposure, thermal, and importance factors. For computation of importance factors, the building was assigned to Risk Category II as defined in the IBC. These factors produced a design flat roof snow load of 35 psf, however, the State of Vermont requires that all roofs be designed for a minimum snow load of 40 psf. Therefore, we have used the code required 40 psf for roof analysis. The code also requires that gable roofs be analyzed for unbalanced snow load conditions.

The existing DPW building is an approximately 40'-0" wide x 98'-0" long single story steel framed building. The roof is framed with 8" deep, 14 gage zee purlins spaced at 3'-10" +/- on center. The zee purlins are supported by custom fabricated tapered steel plate girders at 16'-0" on center. The tapered steel beams are supported by W8x13 steel columns. The roof deck, roof deck attachment, and composition of the roofing were not visible due to the existing continuous batt insulation.

In the southern-most bay, a wood framed storage mezzanine has been constructed within the steel framed building. A painted sign on the outside face of the interior mezzanine indicates "THE LIVE LOAD CAPACITY OF THIS MEZZANINE IS 55 PSF."

The existing light gage zee purlins are adequate for the typical existing dead loads and code required balanced and unbalanced snow loads. The existing purlins would be adequate for a small increase in dead load due to the addition of new lightweight

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insulated roof panels.

The tapered steel roof beams and the rolled wide flange columns are adequate for the typical existing dead loads and code required balanced and unbalanced snow loads. The existing tapered steel beams would be slightly over-stressed, but within commonly accepted structural engineering limits, for a small increase in dead load due to the addition of new lightweight insulated roof panels.

Based on our calculations, the existing roof purlins and adjacent roof beams are not adequate to support the additional wind and snow drift loads created by the roof mounted solar panels.

For approximately 2/3 of it's length, the existing storage mezzanine is framed with 2x12 wooden floor joists at 16" o.c. These joists would be slightly over-stressed, but within commonly accepted structural engineering limits, for the posted live load of 55 psf. Based on the observations made during our site visit, it appears that, at the inner end of the joists, this portion of the existing mezzanine is hung from the light gauge roof purlins with wooden 2x4 "hangers" at each purlin. Each vertical "hanger" is attached to each purlin with (2)-1/2" diameter carriage bolts. The attachment of the hanger to the mezzanine floor structure was not visible. There are numerous structural issues with this method of support. Based on our calculations, the (2)-1/2" diameter carriage bolts attaching the 2x4 hangers to the purlins are adequate for a uniform mezzanine live load of 14.5 psf. Therefore, the bolts would be over-stressed by 165% +/- with the currently posted 55 PSF live load. Second, the existing roof purlins when supporting the hung loads are over-stressed by 11% +/- . Third, the existing tapered steel beam nearest the end of the mezzanine (located approximately 2'-0" from the end of the mezzanine), is already slightly over-stressed due to dead loads and snow loads and would be over-stressed by 26% +/- with the currently posted live load of 55 PSF.

The portion of the mezzanine which is not hung from the roof structure supports mechanical equipment associated with the roof mounted solar hot water system. This equipment includes a 4'-0" deep, 7'-2 1/2" diameter water storage tank. The existing floor framing in this area is 2x6 @ 2'-0" o.c. floor joists spanning approximately 7'-0. Based on our calculations, these members are over-stressed by 200%+. In places, the floor joists are face nailed to face mounted ledgers which do not appear to have the necessary connection strength to resist the 250 +/- PSF load potentially created by a full 4'-0" deep water tank.

The lateral load resisting elements (braces, moment frames, etc) of the existing building were not visible in the sidewalls and the back wall during the site visit. The only wall where evidence of a lateral load resisting system was noted was the in the front wall, where a moment frame was located in one of the overhead door bays. Code requirements for existing buildings specify that if the loads to the lateral resisting systems of existing buildings increase by more than 10%, the entire lateral system must be upgraded to current code requirements. For this building, we have determined that a net dead load increase of 1.5 PSF is allowable without a full analysis/upgrade of the lateral load resisting systems.

On November 7, 2014, I received an email from you indicating that you have determined there is a 4.5" x 12" glulam beam that supports the inside edge of the mezzanine. You also indicated that this glulam beam is supported at both ends by 4.5" x 12" glulam columns that extend down to the concrete floor. We have analyzed this beam, assuming it is made of very high grade material, and have



determined that it does not have adequate strength or stiffness to support the mezzanine with the currently posted live load.

Based on our calculations, neither the glulam beam, or the hanger system from the roof, are adequate to support the mezzanine for the posted live load by themselves. It is likely that the two systems work together to support a load greater than the calculated capacity of either system acting independently. However, it is difficult to predict the amount of load sharing between systems due to variations in materials and workmanship which can have a large effect on the relative stiffness of each system, which directly affects the amount of load sharing.

Our recommendations are the following:

- reinforce the roof structure in the area of the solar panels to resist the code required snow drift loads and wind loads
- re-support the main area of the mezzanine so that the mezzanine is not hung from the roof structure. This would typically involve either adding new columns below the existing beam, adding a new beam below the existing beam, or removing and replacing the current beam with a new beam of adequate strength and stiffness.
- re-frame the remainder of the mezzanine, where the mechanical equipment is located, to eliminate ledger connections, provide new deeper members, and provide joist hangers
- additional onsite investigation, including removal of existing finishes as necessary, to determine if structurally reliable lateral load resisting elements exist in the sidewalls and back walls, and if these elements do not exist, to determine acceptable locations and methods to add these elements to the existing structure.
- if a new shed roof addition is added to the back of the structure, we recommend that the new roof be located at least 2'-0" below the existing eave. This will limit the amount of additional snow that the existing roof must support in an unbalanced snow load condition.

Please let me know if you have any questions regarding this report or my findings.

Sincerely,



Nathan Phillips, P.E.







## FEMA Alternate Project Request

### Project Name

Replacement of concrete box culvert on Route 132

### Description including Time to Complete Project

Replace existing concrete culvert with a metal pipe arch with a 117" minimum clear span and 79" minimum clear height.  
Project would take approximately two weeks to complete.

### Benefit to Norwich

The existing culvert is in such poor shape that it will eventually cave in; causing an emergency repair that would put the burden of the entire replacement cost to the town.  
This project is located in a highly visible area on Route 132, which is one of the main arteries going to the towns of Thetford, Strafford, and Sharon.  
It would demonstrate the benefits of being proactive in the maintenance of stream crossings and proper drainage on this important connecting route.

### First Cost and Source of Match

First Cost: \$125,000.      Source of match: 2016/2017 Public Works Designated Fund-Bridges

### Annual Operating Cost and Source

None

### Life of Project

50 Years

### Other Information

Submitted By: R. Andrew Hodgdon, Norwich Public Works Director    Date: December 1, 2015