



# Town of Holden Beach

## PLANNING & INSPECTIONS DEPARTMENT

**Planning and Inspection  
Director**

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April 21, 2020

To: Town Manager, Town Commissioners and Mayor

From: Timothy D. Evans, Planning Director, *Timothy D. Evans*

Subject: Town Hall Designation and Generator Requirements

At the 17 March 2020 regular monthly meeting of the Town of Holden Beach Board of Commissioners the following 4 (four) tasks for Town Manager action were set forth (Atch 1) to assist them in evaluating options available related to the purchase of a generator for Town Hall. Each task is enumerated below with its corresponding response. Target completion date was 3 Apr in order to be addressed at the April 21 Board of Commissioners' meeting.

### **Task 1.**

Have the Town Planning and Inspections Director prepare a document that defines what a critical facility is and whether Town Hall meets the criteria. Include the citations from government regulations, ordinances, codes etc. that address the classification of a critical facility.

### **Response:**

FEMA guidelines specifically talks about the need to consider police stations and structures that are important (i.e., critical) in the recovery of a governmental entity such as a municipality. The criterium for this does not mitigate occupancy during an event but does inclusively state the structure should be considered and prep for the recovery even after re constitution. The current town hall more than meets those facility requirements. Having those structures in place and protecting them under the town floodplain ordinance is also qualification for points under the CRS program and being prepared for minimum impact and maximum recovery is important under any emergency or natural disaster. The following sources were used to determine the

Town Hall as a critical facility, the authority having jurisdiction must use article 708 of the NEC to determine under the Critical operation Guidelines as to whether a building or facility should be classified and wired for Critical operations, one of several of those criteria is natural disasters and the impact of the loss of the facility. As the authority having jurisdiction it was my predecessor's decision, but I can concur it was the right decision. The second source of requirement is that the local government entity has so designated in the Hazard Mitigation plan that the Town Hall is a Critical Facility and by applying it as such, applied it to the NFIP which in turn looks at it has a point critical component of re-constitution.

## **Task 2.**

Have the Town Planning and Inspections Director advise the Town Manager and BOC on whether a backup generator or power source must be permanently affixed to the critical facility or, in the alternative, can the backup generator or power source be readily accessible on an as needed basis?

## **Response:**

The Town hall was designated as a critical facility based on the current definition as established under FEMA guidelines and by doing so the structure was designed to accommodate the very worst-case scenario by the designing architect and engineers (Stewart Cooper Newell), who specifically designed such for both FEMA and the North Carolina Building Code/ National Electrical Code requirements.

North Carolina Building Code requirements requires that the life safety equipment, egress lights and egress components and Fire Apparatus be fully functional in the absence of primary power. Chapter 32 of the North Carolina Building code specifically states accessible egress elevators must have emergency backup power- and while this could be achieved by some alternate means - the egress lights and fire safety equipment must also be considered

The engineers who originally designed the structure designed it based on the critical facility criterion and made the entire structure, as was required under the North Carolina NEC, to comply with the backup power requirements. In a nutshell the entire electrical system within its main components cannot be rewired without tremendous cost to accommodate just the life safety equipment if the Town so chooses to remove the critical facility designation. This course of action would require a complete rework of the electrical components and would not be cost effective, and under the NEC and COPS criteria would require my approval acting in the Capacity of the Chief Building Official. So yes, the generator must be permanently attached to the Structure.

### **Task 3.**

Request Brunswick Electric perform an assessment of the electrical needs for Town Hall including the recommended size of a backup generator.

### **Response:**

In the process of gathering the information for the commissioners, staff engaged with two electrical engineers (Debra Fish – BEMCO and Allen Cribb – CBHF Engineers, PLLC) and spoke with the original designer of the structure. Mr. Cribb's written analysis is at Atch 2. Both outside engineers and I reviewed the electrical load over a three-year period and concluded that the maximum usage provided indicated that the generator is oversized considerably. Two engineering firms and two separate generator companies' evaluations indicated that a 50 percent reduction in the original generator design would be more indicative of the electrical loads applied for a critical facility under the National Electrical Code.

### **Task 4.**

Based on the findings and recommendations of the Brunswick Electric assessment, and within the legal constraints imposed on purchases, provide information on the cost of electrical equipment that would satisfy the electrical power needs of Town Hall.

### **Response**

Informal solicitations have been acquired that indicate that a generator of sufficient size can be acquired and installed turn key with necessary replacement of the transfer switch for less than \$100k. Lead times can take up to 12 weeks or longer to acquire the power plant and equipment with installation subject to labor availability. Currently the Town is being supplied back up power capability via a rental 150 kw genset costing approximately \$3000/month and which has been procured for 10 more weeks as of this writing.

### **Atchs**

1. BOC Directive
2. Allen Cribb Analysis

## **Town of Holden Beach Board of Commissioner Directives for Town Manager/Attorney Action**

- 1. Date of BOC Meeting**    March 17, 2020
- 2. Agenda Item # 10**
- 3. Issue:** Tasks the BOC requests be done to assist them in evaluating the options available related to the purchase of a generator for Town Hall.
- 4. Request to: Town Manager**
- 5. Motion: Request the Town Manager do the following:**

**Have the Town Planning and Inspections Director prepare a document that defines what a critical facility is and whether or not Town Hall meets the criteria. Include the citations from government regulations, ordinances, codes etc. that address the classification of a critical facility.**

**Have the Town Planning and Inspections Director advise the Town Manager and BOC on whether a backup generator or power source must be permanently affixed to the critical facility or, in the alternative, can the backup generator or power source be readily accessible on an as needed basis?**

**Request Brunswick Electric perform an assessment of the electrical needs for Town Hall including the recommended size of a backup generator.**

**Based on the findings and recommendations of the Brunswick Electric assessment, and within the legal constraints imposed on purchases, provide information on the cost of electrical equipment that would satisfy the electrical power needs of Town Hall**
- 6. Action Requested:** Same as contained in #5 above.
- 7. Vote Tally:** 5-0
- 8. Proposed Deadline:** April 3, 2020 so that the issues can be included in the April Agenda



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April 17, 2020

Mr. Tim Evans  
Planning & Inspections Director  
Town of Holden Beach  
110 Rothschild Street  
Holden Beach, NC 28462

RE: Town Hall Generator  
Holden Beach, NC

Dear Mr. Evans:

CBHF Engineers visited the site and discussed options for replacing the existing generator on April 2, 2020. During the site visit, I investigated the electrical distribution system to understand how the current generator fed the building.

#### **BUILDING ELECTRICAL SYSTEM**

The service entrance voltage is 208/120 volt, three phase, four wire and is fed underground from a pad mounted transformer to a 1200 Amp main service disconnect switch adjacent to the generator. This main service disconnect then feeds the 1200 Amp Main Distribution Panel (MDP) via 1200 Amp Automatic Transfer Switch (ATS). There is currently a 350KW generator that provides emergency backup to the MDP via the ATS. The MDP then feeds the Elevator and four (4) branch circuit panelboards to power lights, receptacles, mechanical/HVAC equipment and miscellaneous loads.

#### **ELECTRICAL SYSTEM CONDITION**

The interior electrical distribution equipment appears to be in good condition. However, the exterior main service disconnect is in fair to poor condition due to corrosion. The generator has failed and needs to be repaired or replaced.

#### **GENERATOR OPTIONS**

During our walkthrough and meeting we discussed three generator options.

##### **Option 1 – Repair Generator**

The coastal environment is not favorable to exterior equipment. The generator is over 10 years old and has multiple levels of corrosion on the enclosure, sub base tank, engine, alternator and

controls/miscellaneous parts. We called Western Branch Diesel (an MTU/Detroit Diesel dealer) and got an estimate from \$40,000 to \$75,000 to repair the existing generator. The range is due to uncertainty on how far to take repairs because of the length of time the generator has been inoperable. The repair would come with a 90-day parts warranty and without a guarantee on how long the generator would operate.

#### Option 2 – Replace generator with appropriately sized generator

The largest building electrical load recorded by the utility over the last 3 years is 68 KW. This indicates the existing 350 KW generator is oversized. It appears the Electrical Engineer of Record sized the generator based on the connected load of approximately 292 KVA. We gave the electrical utility load information and the original building mechanical/electrical drawings to Western Branch Diesel and they indicate a 150 KW generator is a more appropriate size for the building. Based on utility load information, the generator could possibly be smaller, however, this building has approximately 133 KW in Air Handler Supplementary Electric Heaters alone. A possible worst case scenario would be a power outage in the middle of a cold winters night where strip heat is required because the heat pumps can't maintain building temperature requirements. All strip heat would not be on at the same time due to diversity and Western Branch looked at multiple scenarios when sizing the generator. Approximate cost of generator with more robust coastal options is in the \$60,000 to \$70,000 range delivered. This cost does not include installation. This option would require very little building interruption and would probably include abandoning or removing two (2) conductors per phase from the new generator to the ATS.

#### Option 3 – Replace generator with small life safety generator

It was my understanding during the walkthrough the elevator was considered life safety equipment due to egress requirements. The original design indicated a 30 Amp 3 pole breaker to feed the elevator. However, the MDP currently has a 250 Amp 3 pole breaker labeled for the elevator. Based on this, my assumption is a hydraulic elevator was installed vs. what was designed originally.

A life safety only generator would require either considerable rework of the existing ATS and MDP which has 1200 Amps in conductors (expensive) or a new smaller life safety ATS and a new life safety panelboard. This new panelboard would feed the elevator, lighting and any other life safety equipment such as Fire Alarm equipment. The life safety ATS would only be allowed to power life safety equipment and would require a second new ATS and second new panelboard for optional standby power for loads such as lighting, general purpose receptacles and any other load desired on backup power not considered life safety. Based on our experience during the time when this building was designed, elevators were utilizing 40 HP motors and that is in line with the 250 Amp breaker feeding the elevator. An 80 KW to 100 KW generator would be

required for the life safety option (due to the elevator load) with a cost range of \$50,000 to \$60,000 including a more robust coastal package. This cost does not include installation or the new panelboard work and relocating all the life safety loads to the new life safety panelboard or a second transfer switch and panelboard for optional loads. This option will be more invasive inside the building.

#### RECOMMENDATIONS

The main service disconnect switch needs servicing to determine if it can be repaired and if it cannot be repaired, it will need replacing in the future.

We recommend option 2 above. In our opinion, it is the most cost-effective option and keeps the entire building on the generator providing the most flexible building use during an outage.

Let me know if you have any questions or would like any clarifications.

Sincerely,

CBHF ENGINEERS, PLLC



W. Allen Cribb, PE  
Principal



4/17/20