

September 16, 2013

**THE GOLDSTEIN PARTNERSHIP**

The Map Building  
515 Valley Street, Suite 110  
Maplewood, NJ 07040

Attention: Eliot Goldstein, AIA, PP, LEED AP  
Managing Partner

Reference: Preliminary MEP&FP Design Approach  
**Hightstown Municipal Building**  
Becht Engineering BT, Inc. Project Number: 13-0734

Dear Eli:

The following is a preliminary design approach for the mechanical, electrical, plumbing and fire protection (MEP&FP) systems for the above referenced project. Note that we anticipate that a similar approach would be used for both scenarios (renovation/addition and new building) being considered, but with differing costs. Furthermore, the approach is based on our recommendations given the preliminary design information received and information gathered in meetings with the client. The approach could vary significantly based on budget demands, the desire to pursue LEED Certification, or the desires of the client.

**1. GENERAL**

- A. The preliminary designs do not include significant space for utilities and infrastructure. Therefore, we anticipate that additional space will be required to accommodate the following needs, or potential needs.
1. Electrical equipment including a current transformer cabinet, main distribution panelboard, emergency automatic transfer switch, stand-by automatic transfer switch, and distribution panelboards. Note that if a 480Y/277V electric service is utilized, space for transformers and additional panelboards will also be required.
  2. Communication system service entrance demarcation backboard and related equipment.
  3. Additional space will be required to accommodate the client's communication equipment needs. We anticipate that separate communication racks will be required for each of the following:
    - Police communication equipment
    - Dispatch communication equipment
    - Radio equipment
    - Security equipment
    - Voice recording equipment

- Municipal communication equipment
  - 4. Incoming fire water service and sprinkler risers, domestic water service, and utility metering equipment.
  - 5. Domestic water heating equipment including water heater(s), mixing valves and circulating pumps.
  - 6. Janitor's facilities on each floor and drinking water facilities, unless provided by bottled water.
  - 7. If the heating system does include a boiler plant, space will be required for the boiler(s), pumps and hydronic specialties.
  - 8. Shafts through the second floor for supply, return and exhaust ductwork.
- B. If the renovation/addition approach is utilized, we anticipate an approximate 10% increase in costs related to additional capacity, working around existing conditions, etc. Note that we recommend maintaining a minimum 20% contingency at the current programming/concept design phase. Finally, the building size appears to have increased by approximately 20% from the time of the preparation of our original proposal, and may need to increase further to accommodate the above outlined utilities.
- C. Given the nature of the use of the facility, we are anticipating seismic bracing will be provided for all equipment.

## 2. MECHANICAL

- A. Given the size of the facility and due to the segregation of the space and the need for appropriate comfort control, we recommend the use of electric cooling/natural gas-fired heating packaged equipment with variable-air-volume (VAV) distribution systems. A minimum of two units will be utilized to segregate the police and municipal systems. Equipment will be located on the roof, screened if required. Demand control ventilation will be utilized to introduce only the amount of air required to maintain appropriate carbon dioxide levels in areas of high occupancy, which will reduce energy consumption and may assist if LEED Certification is pursued. Approximately 20 tons of cooling per floor is anticipated to be required.
- B. To properly address perimeter heat loss and to allow for heating in perimeter zones when some interior zones may require cooling, we recommend providing a hot water boiler plant piped to perimeter radiation, or to heating coils at VAV terminals for spaces without appropriate locations for radiation. The control of the hydronic heating would be incorporated with the VAV terminal control. The heat in the packaged rooftop equipment would be for morning warm-up and initial tempering during colder periods, with final tempering provided by the hydronic system. Since the rooftop equipment will include heat, we anticipate that the capacity of the boiler plant can be small and won't require redundancy. Although it is relatively new, we do not recommend reusing existing boiler equipment because higher efficiency equipment is available and may be required if LEED Certification is pursued. Note that supplemental electric heat could be substituted for the boiler plant if required due to budget constraints, but will result in

increased operating costs.

- C. Dedicated cooling systems will be provided for the Dispatch/911 Office consisting of a duct-free split system with an evaporator recessed mounted in the ceiling of the space and piped to a remote air-cooled condensing unit located outdoors on the roof or on grade.
- D. Dedicated cooling systems will be provided for the IT Room Office consisting of a duct-free split system with an evaporator recessed mounted in the ceiling of the space and piped to a remote air-cooled condensing unit located outdoors on the roof or on grade.
- E. Dedicated cooling systems will be provided for the Elevator Machine Room consisting of a duct-free split system with an evaporator recessed mounted in the ceiling of the space and piped to a remote air-cooled condensing unit located outdoors on the roof or on grade.
- F. If a boiler plant is included, the Sally Port and Impound Garage can be heated with hydronic unit heaters. If a boiler plant is not included, high-efficiency natural gas-fired unit heaters can be employed.
- G. Locker Rooms, Processing/Holding Areas, Toilet Rooms, Janitor's Closets and the Armory will all be equipped with exhaust systems such that no air will be recirculated from these areas. The Processing Area ventilation must be sufficient for alcohol testing equipment operation.
- H. A direct digital control (DDC) building automation system (BMS) will be provided to control all mechanical systems. All controls will be networked to an operator's workstation with custom graphics to allow for centrally monitoring and controlling all equipment, and will also afford remote monitoring and control.

### **3. ELECTRICAL**

- A. We anticipate the use of a 208Y/120V, 3-phase, 4-wire electrical service to the building. Depending on the final actual size of the building, we preliminarily anticipate a capacity of 600 Amperes or 800 Amperes. If the former, the service could likely be from pole mounted utility transformer, and if the latter a pad mounted transformer will likely be required. Note that a 480Y/277V service could be considered, with the benefit of reduced feeder sizes for equipment served by the higher voltage. However, this would necessitate the provision of transformers in the electrical distribution systems to serve all 208Y/120V loads, as well as the associated transformer costs.
- B. We anticipate an emergency power system comprised of a diesel-fueled packaged generator with base tank and sound attenuating enclosure located outdoors on grade. Two automatic transfer switches will be required; one serving life safety (emergency) loads and the other serving stand-by loads. Based on our discussions in a meeting on August 26, 2013, we do not anticipate supporting the entire

building, with the generator and related equipment serving only the following:

- Lighting throughout Police Areas; exit and emergency egress lighting only throughout Municipal Areas.
- All IT, radio, communication, security equipment.
- IT Room dedicated cooling.
- Communication (Dispatch) Room, including dedicated cooling.
- Ventilation fans and heating components/controls for system(s) serving Police Areas. Note that we do not anticipate supporting air conditioning other than for the Communication Room.
- Assuming a boiler plant is utilized, the boiler and circulating pumps.

The elevator will not be supported by the generator, but can be specified to return to the egress level by gravity if desired. Finally, we are assuming that a fire pump will not be required to be supported by the generator.

We do not anticipate reusing the existing generator at the temporary Police facility. This generator was purchased second hand such that the maintenance history is not known, and the capacity may not be appropriate for the proposed needs. If additional consideration for reusing the existing generator is desired, we can revisit the required capacity during design development. However, the existing generator output is 480Y/277V, so the electrical service to the new facility would need to be coordinated accordingly.

- C. Although excluded from our original proposal, we recommend the installation of a central uninterruptable power supply (UPS) system. Given the quantity of small, local UPS devices observed during our site visits on September 12, 2013, it is apparent that the local UPS approach is inconvenient and will create maintenance and reliability issues. The intent will be for the central UPS to support everything that is also supported by the generator. Although this load may seem significant, the battery requirements will not be since the generator should restore alternate power within 10 seconds.
- D. The facility will be equipped throughout with an addressable fire alarm system. Initiating devices will include manual pull stations at the egress paths, as well as sprinkler system flow and tamper devices. Signaling devices will include A.D.A. compliant audible/visual appliances throughout the facility. Heat detection and smoke detection are not anticipated to be required for this fully suppressed facility, with the exception of devices required for elevator recall.

#### **4. PLUMBING**

- A. Sanitary sewer, storm sewer, fire water, domestic water and natural gas utilities to the building shall be provided by the Civil Engineer, including utility company contacts and coordination.
- B. Plumbing fixtures will be in accordance with the final architectural design. We anticipate the use of vitreous china fixtures in most areas, with detention grade stainless steel combination water closet/lavatory fixtures in holding cells. Final

fixture selections will be coordinated with the Architect and Client. Waterless urinals can be considered if LEED Certification is pursued.

- C. Although the client expressed an interest in instantaneous domestic water heating equipment, we recommend the use of central, natural gas-fired storage type heating systems with mixing valves which provide the proper temperatures for the uses in the facility. Given the quantity of fixtures, the distance between fixtures, and the quantity of shower facilities, instantaneous equipment would become prohibitively large in input capacity. The domestic hot water system will include a re-circulating loop and pump to maintain the water temperature throughout the system.
- D. We originally envisioned one emergency shower/eyewash station located in the Sally Port. However, the Impound Garage may be a more appropriate location if adjacent to the Armory. Alternatively, both locations can be equipped with an emergency shower/eyewash station.
- E. The client has requested a hose station in the Sally Port. However, we do not anticipate vehicle maintenance requiring compressed air systems, trench drains with oil separators, etc.
- F. Low slope roofs will be provided with interior roof drainage systems comprised of roof drains, overflow drains and interior roof drainage leaders.
- G. Exterior non-freeze wall hydrants will be furnished at locations desired by the Client. A domestic cold water connection will also be provided to a landscape irrigation system, if applicable.
- H. Natural gas piping systems will be provided for space heating and domestic water heating equipment.
- I. The elevator pit will be equipped with a sump that includes a pump with an oil separating feature.
- J. We are assuming that a radon gas ventilation system will not be required.

## **5. FIRE PROTECTION**

- A. The building will be provided with full coverage wet pipe fire sprinkler systems. The coverage, quantity of risers, etc will be appropriate for the use of the space.
- B. We are assuming there are no pre-action, dry, or dry chemical fire protection systems requirements.
- C. We are assuming that a fire pump or hydro-pneumatic tank will not be required. However, a flow test should be performed to confirm adequate flow and pressure are available for the fire water needs of the building without these amenities.

## 6. SECURITY

- A. The facility will include a closed circuit television system (CCTV) consisting of fixed cameras at locations identified by the client and digital video recording (DVR) equipment. The existing CCTV system located at the temporary Police facility will be relocated and expanded with additional cameras at the new facility. Cameras will be provided at the following locations:
- Processing
  - Holding Cells
  - Sally Port
  - Impound Garage (back-up Sally Port)
  - Court viewing both front and rear
  - Exterior perimeter
  - Perimeter doors
  - Lobby
  - Inside elevator
- B. The facility will include access control systems and door interlock/release systems at exterior and interior doors identified by the client. The existing Kantech KT300 access control system located at the temporary Police facility will be relocated and expanded with additional door control at the new facility. The Police Department will program all access cards/fobs using relocated equipment to allow for proper access for both Police and Municipal staff.
- C. The Sally Port will be equipped with interlocks on doors to prevent simultaneous opening per Department of Correction requirements.
- D. A duress alarm systems will alert the Communication (Dispatch) Room of adverse events in the facility via manual activation by occupants. Locations shall be as follows:
- Court Dais
  - Court Office
  - Tax Collector Office
  - Records Office
- E. Select doors will include doorbells that ring at the Communication (Dispatch) Room to allow Dispatchers to view the door via the CCTV system and release the door remotely via the access control system.
- F. The Client has requested that intrusion detection systems be incorporated into the security systems. When approved plans are developed, we can revisit this requirement. Note that coordination with the access control system could become complex.
- G. Holding cells will include mechanical locking hardware.



## 7. COMMUNICATION SYSTEMS

- A. Telephone and data structured wiring systems will be furnished throughout. Independent systems must be maintained for Police, Municipal and Municipal Court functions. The construction contract will include the structured wiring from patch panels at Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) Rooms or Closets to wall or furniture mounted receptacles. Hardware, racks, rack mounted servers, etc. shall be provided and installed directly by Client Vendors.
- B. All 911 equipment including the Crucial voice recorder was recently acquired and will be relocated from the temporary Police facility. The Client will provide an equipment inventory.
- C. All Communication (Dispatch) Room equipment was recently acquired and will be relocated from the temporary Police facility with the exception of furniture. There are currently one large and fifteen smaller flat panel LCD dispatch screens.
- D. Police communication systems currently include 12 tower mounted radios and the related communication hardware. The tower is currently building roof mounted at the temporary facility which is at a high elevation. An evaluation is required to identify if the tower will be building or ground mounted at the proposed facility, which is located at a lower elevation. Portable radio equipment includes two charging stations capable of charging six portable radios each, and four single radio chargers. All radio equipment will be relocated for continued use. An existing mobile dispatch unit will be utilized during relocation.
- E. The main Fire Department communication radio is currently located on First Avenue on the water tower. There is dedicated connectivity provide by Verizon to the temporary Police facility. Verizon no longer supports this type of connectivity, so an alternate needs to be investigated for the new facility. The Fire Department is dispatched by the County, and Hightstown dispatches Emergency Medical Services (EMS).
- F. Existing telephone equipment was recently acquired and will be relocated from various locations and reused. The existing system includes Avaya hardware utilizing a voice over internet protocol (VoIP) that is serviced by Comcast. Police communication systems require secure government fiber optic connections. Dedicated T-1 connections are required, as well as several dedicated POTS connections. Dedicated connections include, but are not limited to:
- 911 (backed-up by East Windsor, then Cranbury)
  - NCIC Criminal Justice Computer System
  - State Police
  - Alcohol Testing Equipment
  - Cranbury Dispatch
  - Future Dispatch for other Municipalities
  - Municipal Court (x6)?

The local Verizon infrastructure in the area is very unreliable, with frequent service disruptions.

- G. The Municipal Court will require secure video conferencing capabilities for video arraignment, a court recording system, a public address system and credit card payment equipment. All equipment will be relocated from various locations.
- H. Police interviews are currently performed in another town due to the lack of recording equipment. A new, independent recording system is required for Police interviews that will meet the requirements of the State's "Recordation Directive". Mug shots are acquired through the phone system.
- I. The Municipal Court Dais will require wireless connectivity for mobile computing devices.
- J. A large format scanner is desired in the Municipal Area.
- K. The State of New Jersey will provide their IT infrastructure for Municipal Court.
- L. We are assuming that intercom systems will not be required, other than features provided through the existing phone systems.

## **8. AUDIO/VISUAL SYSTEMS**

- A. Flat panel televisions will be provided in all Conference Rooms.
- B. A projector and screen will be provided in Municipal Court.

## **9. LIGHTNING PROTECTION SYSTEMS**

- A. Lighting protection systems consisting of air terminals and conductors in accordance with NFPA 780 will be provided. The installing Contractor will obtain a Master Label for the completed installation in accordance with NFPA 780.

## **10. LEED CERTIFICATION**

- A. The decision regarding pursuing LEED Certification should be made prior to mobilizing on the design since the design approach could vary significantly.



Although the above outlines the proposed design approach and significant information gathered regarding the client's needs, we welcome the opportunity to refine the above in completing the programming and conceptual design phases of the project.

Very truly yours,  
**BECHT ENGINEERING BT, INC.**



Robert G. Bryant, Jr., PE, CEM  
Principal/President