

21 May 2021

Siobhan Koch, Director
Denville Public Library
121 Diamond Spring Rd
Denville, NJ 07834

Re:
ADDITION & ALTERATION TO THE DENIVLLE PUBLIC LIBRARY
121 Diamond Spring Rd
Denville, Morris County, NJ

BUILDING ANALYSIS & REGULATORY APPROVAL REQUIREMENTS

Basis: Existing Construction Documents dated (C/CC/199X), NJUCC, IBC 2018

Summary:

Alteration work must comply with applicable portions of NJAC 5:23-6.6.

Renovation must comply with applicable portions of NJAC 5:23-6.5.

Additions must comply with NJAC 5:23-6.32.

All work will maintain or improve accessibility for the handicapped.

Work Summary:

Addition, Alteration and Renovation to existing Public Library Facility including equipment, finishes, ventilation lighting and plumbing upgrades.

Approximate square footage of existing facility:	10,000
Approximate square footage of proposed additions:	3,800
Approximate square footage of renovation areas	2,900

Use Group Classification (NJIBC Section 302):

Existing building classified as Use Group A-3 (Assembly – Public Library)

Existing Construction Type (NJIBC Table 601): IIIB, unprotected

Regulatory Agency Approvals required/Code Compliance List (obtained or to be obtained)

NJ Uniform Construction Code, NJAC 5:23, including the Rehabilitation sub-Chapter 6 (Renovation)

International Building Code 2018, NJ edition

National Electrical Code 2017 (NFPA 70)

ASHRAE 90.1-2016

ASHRAE 62.1-2016

International Mechanical Code 2018

National Standard Plumbing Code 2018

International Fuel Gas Code 2018

Morris County Soil Conservation District

NJDEP Individual Flood Hazard Area Control (Riparian Zone)

The existing single-story building, constructed in 1985, was designed to serve as a public library. Renovations in 2009 replaced the original circulation desk with a new built-in desk and subdivided space to create a separate Children's Library.

The building is constructed of exterior concrete block bearing walls clad in brick veneer; with a steel super structure and a concrete slab on grade floor structure. Existing and proposed layouts are included in the Drawing Package.

The facility appears well-maintained. All primary structural frame components as well as the building envelope are in good condition. A separate report prepared by Barone Engineering Associates, LLC provides an evaluation of the existing systems and infrastructure (Mechanical, Electrical, Plumbing & Fire Protection Systems).

Proposed improvements and expansion plans further the mission of the library and are appropriate for the site.

Sincerely,
DE BIASSE & SEMINARA ARCHITECTS, PC



Virginia Seminara, AIA, PP
vs:gw

Barone Engineering Associates, L.L.C.

100 Oak Ridge Road
Oak Ridge, NJ 07438
Phone: 973-492-1220
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System Analysis for the Denville Public Library – 3-5-20

Revised 6-1-21

General Design Criteria:

All Mechanical, Electrical, and Fire Alarm systems will be designed based on the following codes and standards:

- o 2018 International Mechanical Code
- o 2018 International Building Code, New Jersey Edition
- o 2018 National Standard Plumbing Code
- o 2017 National Electric Code
- o ASHRAE 90.1-2016 (Energy Code)
- o ASHRAE 62.1-2016
- o All Applicable ASHRAE and SMACNA Standards
- o All other applicable Federal, State and Local Codes
- o 2016 NFPA 72 (National Fire Alarm Code)
- o All other applicable standards

PLUMBING SYSTEM:

The building will be provided with its own city domestic water service via a 2" diameter Class 52 cement-lined Ductile Iron cast iron pipe. The Domestic service within the water service room (extended from the city main) will be a 2" diameter copper with 2"RPZ and 2" pressure reducing valve to lower the pressure below 80 psi. The Hot & Cold water supply and return system piping will be type "L" copper with wrought fittings utilizing lead-free soldered joints. The existing electric Water Heater shall be reused, and relocated to the janitors' closet, and mounted on a platform above the sink. Cold water, hot water and hot water recirculating piping shall be insulated throughout with fiberglass pipe insulation and PVC Zeston pre-molded fittings. Cold water piping shall be covered with ½" thickness and Hot and Hot Water Return Piping should be 1" thickness.

Sanitary drainage from the building will be connected to the municipal sewage system via an existing forced main from a new packaged sewage duplex pump station. The existing sewage ejector pump will be abandoned and removed, and the slab repaired as necessary. A new 4" diameter sanitary sewer line will be installed to service the new bathroom layout in the existing section of the building, running outside across the front of the building and into a new packaged sewage ejector duplex pump system that will connect to the existing forced main. All sanitary, waste and vent piping within the building shall be PVC Schedule 40 pipe and fittings with solvent weld joints. Refer to the attached Plumbing drawing P-1. All plumbing fixtures used will exceed the water conservation guidelines in the current codes. All plumbing fixtures shall be Low-Flow water conserving types as selected by the Owner/Architect.

The existing gas service will be upgraded to handle the additional load of the new gas fired rooftop AC units, and the emergency generator. Gas piping will be schedule 40 black steel with malleable fittings. All joints made in piping 3" diameter and larger shall be welded, below 3" they can be threaded with joint compound. Supply a complete and operating Natural Gas piping system to service all gas-fired HVAC appliances. The existing gas meter may need to be relocated to coordinate the installation of the new Fire/Domestic Water Service.

The following is a summary of items per the scope of work/basis of design:

- A. New Plumbing Fixtures (new and replacement of existing).
- B. New Sewage Ejector Duplex Pump System
- C. Re-pipe existing fixtures
- D. Sawcut/Patch slab
- E. Demolition existing sewage pump
- F. New gravity sewer to pump
- G. Upgrade existing Water Service
- H. New Gas Piping to new RTU's
- I. New Gas Main to Building due to new RT units and Generator.

ELECTRICAL SYSTEM:

The existing building service is a 400Amp at 120/208V 3Phase 4Wire and fed from a pole mounted transformer. The service runs from the pole mounted transformers underground into the building main electrical service room via one set of conductors. The main electrical service room is comprised of the utility CT cabinet/meter, Main Distribution Panel (MDP), with 400Amp Main Breaker, and sub-panels HP-1 and LP-1. The MDP feeds the sub-panels, existing sewage ejector pumps (that are to be removed), and the Roof Top HVAC units.

With the new building expansion areas and proposed new loads, the existing service size has been analyzed. Based on the review of the existing utility demand kW load over a period of 12 months and proposed new general power, lighting, new sewage ejector pumps, and HVAC loads, we recommend that the existing service be upgraded from 400Amps to 600Amps.

Additionally, we propose a new stand-by natural gas generator system – 150kW 120/208V 3Phase 4W in an outdoor enclosure (Level I sound attenuated enclosure) to be installed adjacent to the main electrical service room.

I. Scope #1 - The following is a summary of the electrical work for the building expansion areas:

- A. Installation of new circuits for new lighting and receptacles.
- B. Installation of new circuits for general HVAC power – new HVAC units, electric heat, and exhaust fans for bathrooms.
- C. Installation of new circuit for the new sewage ejector pumps based on new plumbing design.
- D. To facilitate the new circuits, a new 200Amp panelboard shall be located at the new storage room and fed from the new MDP per scope #1.

II. Scope #2 - The following is a summary to upgrade the existing service:

- A. Remove existing service lateral from the pole mounted transformers. Upgrade of the service transformers (by utility company).
- B. Install new service, comprise of 8-350MCM in 2-4" PVC conduits from new transformers down the pole, under the sidewalk, and to a new exterior CT cabinet located on the exterior of the present electrical room.
- C. Remove the existing CT cabinet in the existing service room and install a new 600Amp fused disconnect in the same location.
- D. Remove the existing 400Amp MDP with a new 600Amp MDP and re-connect existing circuits and feeds.

III. Scope #3 - The following is a summary of the electrical work for the Emergency Generator System:

- A. Supply and installation of a new 150kW/187.5kVA natural gas Generator in a level I sound attenuated outdoor enclosure.
- B. Supply and installation of a new 600A Automatic Transfer Switch located on the building exterior adjacent to the main electrical service.
- C. Supply and installation of a new 600Amp feeder from the new main 600Amp service disconnect (per Scope #1) to the normal side of the new ATS.
- D. Supply and installation of a new 600Amp feeder from the generator output to the emergency side of the ATS.
- E. Supply and Installation of associated control wiring and remote generator annunciator.

IV. Scope #4 – Fire Alarm Devices for new areas (Expansion of existing system for new areas).

New fire alarm devices shall be required, which includes smoke/duct detectors, heat detectors, pull-stations, control relays, etc. This excludes a new Fire Alarm Panel; we are assuming the reuse and extension of the existing FACP.

MECHANICAL SYSTEM:

The existing building is served by a series of (4) York electric cooling and gas-fired heating rooftop units. The total installed cooling capacity is 24 tons, and 600,000 BTU of heating input capacity. There appears to be adequate cooling and heating capacity to serve the existing Library.

In our opinion it is impractical to utilize the existing HVAC system to serve the proposed additions. The size of the addition proposed on the north side of the building is large enough to require its own HVAC system. There is not enough existing cooling capacity to serve the proposed Children's and Adult Reading Rooms on the west side from the existing HVAC systems on the roof.

We propose that a 10-ton cooling capacity rooftop unit with gas heat be installed to serve the new addition on the north side of the building. The system will be a variable air volume (VAV) system with (4) temperature control zones for the individual spaces and lobby.

The proposed Children's and Adult Reading Rooms on the west side should be furnished with a 3-ton HVAC system. The equipment could either be mounted on the roof and ducted below, or split with an outdoor condensing unit and indoor air handling unit.

The following is a summary of the HVAC work for the building expansion areas:

- A. 10-ton electric cooling/gas heating VAV rooftop unit for the north side addition.
- B. (4) Variable Air Volume Boxes and controls
- C. 3-ton HVAC system (either roof mounted or split) for the Children's and Adult Reading Rooms
- D. Insulated sheet metal supply and return air ductwork distribution for both systems.
- E. Supply Air Diffusers, Exhaust Registers and Return Air Grilles for both systems.
- F. Toilet Exhaust Fans, sized per code
- G. Exhaust air ductwork.
- H. Control systems, as required by the current energy code.

Opinion of probable cost for the HVAC systems for the building expansion areas:

\$120,000.00