BLOOMFIELD PUBLIC LIBRARY
NEW PROSSER LIBRARY

SCHEMATIC DESIGN REPORT
March 30, 2022

ARCHITECT
TSKP Studio, LLC
Hartford Square West, 146 Wyllys Street Unit 1-203
Hartford, CT 06106
(860) 547-1970

PROFESSIONAL CONSULTANTS

<table>
<thead>
<tr>
<th>Civil Engineer</th>
<th>Landscape</th>
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<tbody>
<tr>
<td>SLR</td>
<td>Richter &amp; Cegan</td>
</tr>
<tr>
<td>99 Realty Drive</td>
<td>Avon Park North P.O. Box 567</td>
</tr>
<tr>
<td>Cheshire, CT 06410</td>
<td>88 Canal Court</td>
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<tr>
<td></td>
<td>Avon, CT 06405</td>
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<table>
<thead>
<tr>
<th>Structural</th>
<th>MEP/FP Engineer</th>
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<tr>
<td>Michael Horton Associates</td>
<td>RZ Design Associates</td>
</tr>
<tr>
<td>151 Meadow Street</td>
<td>750 Old Main Street, Suite 202</td>
</tr>
<tr>
<td>Branford, CT 06405</td>
<td>Rocky Hill, CT 06067</td>
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SCHEMATIC DESIGN
March 30, 2022

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ARCHITECTURAL NARRATIVE

SCOPE OF WORK - OUTLINE SPECIFICATIONS

Division 2 – Existing Conditions

1. Structure Demolition: Demolition of all buildings on the site, including foundations.
2. Site Demolition: Remove utilities where indicated on the drawings, pavement and other site improvements.
3. Hazardous materials: Refer to Hazardous Building Materials Inspection Reports prepared by SLR.

Division 3 – Concrete

1. Structural Concrete: See structural narrative.
2. Precast Architectural Concrete: Precast concrete trim units at exterior walls, window headers and sills.

Division 4 – Masonry

1. Typical Exterior Wall Construction: 4” exterior face brick, air space, 3” rigid insulation, fluid applied membrane air and vapor barrier, 8” metal studs and 5/8” gypsum wall board.
2. Exterior Walls at Garage: 4” exterior face brick, air space, 8” interior CMU.
3. Fire Rated Interior Walls at Stairs and Elevator Shaft: 8” CMU with 1 5/8” metal furring and 5/8” gypsum wall board.
4. Site Walls: 4” exterior face brick.

Division 5 – Metals

1. Structural Steel Framing and Metal Decking: See Structural Narrative.
2. Cold formed Metal Framing: 18-gauge steel studs at exterior wall assembly; stud framing for interior partitions in sizes as indicated on the drawings.
3. Metal Fabrications and Metal Stairs: Stairs and stair railings, guardrails, elevator pit ladder, loose lintels, roof access ladders.

Division 6 – Wood and Plastics

1. Rough Carpentry: Blocking, curbs, backing panels.
5. Porch Decking: 1”x4” Teak or IPE.
6. Bridge Decking: 1”x4” Teak or IPE.
8. Interior Architectural Woodwork: Clear finish bamboo AWI custom grade wood veneer on wheat board with w/solid surface tops. Certified sustainable hardwood trim and veneer.

Division 7 – Thermal and Moisture Protection

1. Fluid Applied Waterproofing Membrane and Protection Board: Exterior side of below grade walls at Lower Level, around the following:
   a. Stair North
   b. Sprinkler/Water Service Room
   c. Electric Room
   d. Mechanical Room
   e. Friends of the Library/Library Store
   f. Entry Vestibule
   g. Elevator.
2. Thermal Insulation:
   a. Perimeter Slab and Foundation Wall: 2” – R10 extruded polystyrene board.
   b. Cavity Wall: 3” – R15 or 4” – R20 extruded polystyrene board.
   c. Roof: 5” minimum – R20 extruded polystyrene.
3. Modified Bituminous Sheet Air Barrier: In cavity wall.
4. EPDM roofing: Light Color with min SRI 78: At low slope roof areas not visible from grade, metal fascia along roof edge.
5. Roof Drains: Within roof area, connected to internal storm water piping, plus overflow outlets.
6. Roof Hatches: 1 unit for access to roof, at North Stair.
7. Penetration Firestop Systems: At rated assemblies, UL listed systems where required by code.

Division 8 – Doors and Windows

1. Metal Doors and Frames:
   b. Interior Doors: 18-gauge.
   d. Interior Frames: 16-gauge.
3. Aluminum Framed Entrances and Storefront: Thermally broken EFCO or equal.
4. Aluminum Curtain Wall: Thermally broken EFCO or equal.
6. Aluminum Windows: Thermally broken, EFCO or equal.
7. Hardware: Heavy commercial grade.
10. Card Readers: at all exterior doors
11. Glazing:
   a. Safety Glazing: Firelite impact resistant ceramic safety glazing or equal at South Stair.
   b. Insulated Glass: 1” thick Low-E, high performance. U-0.375 (COG U-0.25), SHGC 0.39.
      Exterior glazing up to 60” above floor to be tempered/laminated glass.
   c. Tempered Glass: ¼” at interior applications.
12. Vertical Louvers: Custom fabricated using 2”x8” aluminum tubes.
13. Skylight: above South Stair, 36” round.
14. Access Doors and Frames: Painted steel, where required at ceilings to access mechanical equipment.

Division 9 – Finishes (see also Finish Schedule below)

1. Drywall: 5/8” typical.
2. Flooring:
   a. Sealed Concrete Floor at Lower Level.
   b. Carpet Tile.
   c. Rubber Flooring: at exit stairs).
   d. Ceramic Tile: 2x2 on floors, base and walls (toilet rooms).
   e. Epoxy painted floors.
3. Ceilings (refer also to reflected ceiling plans):
   a. Acoustical Tile: 2’x2” ¼” USG Mars ClimaPlus or equal (NRC not less than 0.65).
   b. Grid: Face, Capped, Double-web steel suspension system.
   c. Wood Ceiling: where indicated on ceiling plans, above Living Room, acoustically rated, perforated wood.
   d. Custom Ceiling Panels: in Library Center, hardwood veneer plywood, 2’ x 8’ panels.
   e. Community Room: custom ceiling.
   f. Painted Gypsum Wall Board: Toilet Rooms.
4. Painting: Low VOC Paints:
   a. Walls: Latex Eggshell.
   b. HM Doors and Frames: Oil Semi-Gloss.
   c. Drywall Ceilings: Latex Flat.
   d. Toilet Room Ceilings: Epoxy paint.
5. Acoustic panels: 1” thick, fabric-wrapped; on brick piers in Library Center, and where indicated on interior elevations.

Division 10 – Specialties

1. Visual Display Surfaces:
   a. Tack boards: Made of waste cork and linoleum with backboards of certified formaldehyde-free plywood.
   b. White Boards: TBD.
2. Display Cases: TBD.
3. Electronic Display: TBD.
4. Signage:
   a. Exterior, Building Identification: TBD.
   b. Interior, ADA-compliant room identification.
c. Interior, commemorative plaque and area designations.
5. Metal Lockers: In Staff Area.
6. Toilet and Bath Accessories:
   a. Electric hand dryers.
   b. Dual type toilet paper dispensers, soap dispensers, sanitary napkin disposal units, grab bars, mirrors, utility hooks.
   c. Baby changing stations.
7. Fire Extinguishers, Cabinets, and Accessories: no ozone depleting substances.
9. Flag Pole: Wall mounted, final location TBD.

Division 11 – Equipment

1. Library Book Return: Thru-wall type, Kingsley or similar.
2. Projection Screen: 12 ft w. ceiling recessed, electric screen in Community Room.
3. Residential Appliances: Countertop microwave and under counter refrigerator.

Division 12 – Furnishings

1. Window Shades: Roller Shades, motorized, single roll units typical. Double shade with black out roller shade in Community Room.
2. Entrance Floor Mats and Frames: Recessed, roll-up vinyl-acrylic tread rail, hinged mat with aluminum frame, in vestibules.

Division 13 – Special Construction – Not Used.

Division 14 – Conveying Systems

1. Passenger Elevator: Otis 3500 lbs.

Division 32 – Exterior Improvements

1. Prefabricated Pedestrian Bridge. Painted galvanized steel structure, steel railings to match structure, lighting system integrated with railings, decking to match Library Porch (1”x4” Teak or IPE).
FINISH SCHEDULE

Lower Level

Mechanical & Electrical Rooms, Stairs, and Friends of the Library
Floor: Sealed concrete with rubber base.
Walls: Epoxy paint on CMU.
Ceiling: As shown on reflected ceiling plans.
Specialties: ¾” MDO fire-rated plywood painted with matte white fire retardant paint, on all wall surfaces in Electrical Room.

First and Second Floors

Vestibules
Floor: Recessed walk-off mat with porcelain tile base.
Walls: Painted gypsum wall board.
Ceiling: Painted gypsum wall board.

Staff Offices and Work Areas
Floor: Carpet Tile.
Walls: Painted gypsum wall board.
Ceiling: 2x2 acoustic tiles in suspended grid.

Service Desk Areas
Floor: Carpet Tile.
Walls: Painted gypsum wall board.
Ceiling: As shown on reflected ceiling plan.
Specialties: Custom millwork.

Community Room
Floor: Linoleum with rubber base.
Walls: Painted gypsum wall board.
Ceiling: Custom ceiling.
Specialties: Acoustic panels at solid walls, Projection Screens.

Café
Floor: Linoleum with rubber base.
Walls: Painted gypsum wall board.
Ceiling: As shown on reflected ceiling plan.

Kitchen
Floor: Epoxy floor and base.
Walls: Ceramic tile.
Ceiling: 2x2 acoustic tiles in suspended grid.
Specialties: Custom millwork and cabinets.
### Custodial and Storage Rooms
- **Floor**: Epoxy floor and base.
- **Walls**: Epoxy paint on gypsum wall board.
- **Ceiling**: 2x2 acoustic tiles in suspended grid.
- **Specialties**: Mop rack and shelf.

### Adult Area/Teen Center/Children’s Areas
- **Floor**: Carpet Tile.
- **Walls**: Painted gypsum wall board.
- **Ceiling**: As shown on reflected ceiling plans.
- **Specialties**: Acoustic panels at solid walls.

### Stairs
- **Floor**: Rubber with rubber base.
- **Walls**: Epoxy paint on CMU.
- **Ceiling**: As shown on reflected ceiling plan.

### Toilet Rooms
- **Floor**: Ceramic tile floor and base.
- **Walls**: Ceramic tile.
- **Ceiling**: Painted gypsum wall board.
- **Specialties**: Toilet partitions and accessories.

### Conference and Meeting Rooms
- **Floor**: Linoleum with rubber base.
- **Walls**: Painted gypsum wall board.
- **Ceiling**: 2x2 acoustic tiles in suspended grid.
SITE / LANDSCAPE ARCHITECTURAL NARRATIVE

SCOPE OF WORK - OUTLINE SPECIFICATIONS
The following outlines the scope of work for the new construction:

Roadways and Vehicular Circulation
- Bituminous concrete pavement shall consist of 2-inch thick bituminous concrete wearing course over a 2-inch thick binder course installed on 6 inch depth compacted processed aggregate base material (CT DOT Form 818, Section M.05.01).
- Curbing adjacent to concrete pavement shall be integral concrete curb poured monolithically with the sidewalk, 6 inch reveal typical with 18 inch minimum overall haunch depth.
- Other site curbing shall be precast concrete curbs, 6 inches wide by 18 inches high, on 6 inch depth compacted processed gravel base and composed of 3500 psi air-entrained concrete.
- Pavement sections are subject to modification based on any additional information or revisions that may be provided by the Geotechnical Engineer.

Sidewalks and Pedestrian Circulation
- Concrete pavement (pedestrian) shall consist of 5 inch thick 4500 psi air-entrained concrete reinforced with epoxy coated welded wire fabric on 8 inch depth compacted processed aggregate base (CT DOT Form 818, Section M.05.01).
- Expansion joints (16’ o.c. max.) and control joints (4’ o.c. max.) shall be provided in all concrete paving. All expansion joints shall be doweled and sealed. Control joints shall be tooled joints.
- Detectable warning pavers shall be cast-in-place cast iron (dipped finish) at all curb ramps.
- Pavers shall be 2 ½ inches thick 5000 psi concrete pavers. Pavers shall be set on sand setting bed over concrete pavement base with holes drilled for drainage and polymeric sand swept joints. Aluminum edge restraint shall be installed where pavers meet lawn or plant bed conditions.
- Pavement sections are subject to modification based on any additional information or revisions that may be provided by the Geotechnical Engineer.

Retaining and Site Walls
- Retaining walls shall be stone veneer with architectural cast stone coping, over cast-in-place concrete.
- All concrete wall footings and reinforcing to be detailed by engineer.

Stairs and Ramps
- All stairs and ramps shall be cast-in-place concrete with epoxy coated reinforcing and haunched edges on compacted base.
- Provide handrails on both sides of stairs and ramps, and continuous at mid landings. Provide (2) two additional handrails within the interior of the entry stairs.
- Finish: broom finish on horizontal surfaces and smooth rubbed finish on all exposed vertical surfaces.
- Haunch edges to allow for 8 inch minimum handrail embedment.
- All ramps shall be ADA compliant with a maximum slope of 1:12 (8%).
Handrails
- All handrails shall be stainless steel, Type 316. Typical height: 34 inch high top rail, with 22 high lower rail for younger users.
- All handrails shall be ADA compliant.
- Handrails shall be architecturally detailed to complement architectural handrails/guardrails.
- All posts shall have decorative flanges of same material/finish.

Landscape Amenities and Equipment
- Maintenance Strip: an 24” wide mow strip with 2” depth of flexible porous pavement system and 4” of 3/4” process aggregate base shall be placed where lawn meets building. Maintenance strip shall be bordered by flush concrete curbing where abutting lawn or plant bed conditions.

Landscaping
- Shade trees, ornamental trees and shrubs, perennials and groundcovers are incorporated throughout the library site, as shown on the Site Plan.
  - Shade Trees:
    - Size: 4 – 4 1/2” caliper.
    - Qty: 40.
  - Ornamental Trees:
    - Size: 4” – 4 1/2” caliper.
  - Shrubs:
    - Size: 24”-30” height.
    - Qty: 152 deciduous shrubs, 221 evergreen shrubs.
  - Perennials/Groundcover:
    - Size: #1 Container.
    - Qty: 114.
- Plant bed mix: 18 inch depth, mix of screened topsoil and compost.
- All lawn areas shall be provided with 6 inch depth of screened and amended topsoil.
- Landscape edgings shall be used where plant beds abut lawn areas. Material: aluminum, mill finish.
- Mulch: 3 inch depth for trees and shrubs, 2 inch depth for perennial and groundcover beds. Material: double shredded hardwood bark, natural color, un-dyed.
CIVIL NARRATIVE

General

The new systems will be designed in accordance with the requirements of the following codes and standards:

- State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 818
- Town of Bloomfield, Connecticut

Available Utilities

The available utilities are as follows: Electric (Eversource), telephone (Frontier Communications and Comcast), Water (The Metropolitan District), Gas (Connecticut Natural Gas), and Sanitary Sewer (The Metropolitan District).

Schematic Storm Water Management Approach

Currently, storm runoff from the site passes overland, and through piped systems to the adjacent Wash Brook with respect to both properties. An existing 24” RCP conveying state of Connecticut drainage leads to a concrete bridge culvert across the frontage along Mountain Avenue (Route 178). Both parcels lie within the FEMA floodplain as identified on the plans and survey.

Storm runoff from the improved areas and proposed building will be collected by a series of yard drains, catch basins and roof drainage systems. The proposed improvements are currently determined to have a decrease in the amount of impervious surfaces and therefore a storm water detention system will not be required to mitigate peak flows. Instead, two water quality basins and two water quality units are proposed to provide greater water quality than exists on-site today. The water quality basins are sized to handle the 1” of runoff and therefore also cover the required CT DEEP groundwater recharge volume. These basins also provide compensatory storage for the proposed filling within the floodplain. Storm runoff will follow existing patterns, draining to the Wash Brook.

Best Management Practices will be adhered to for treatment of storm water for pollutant removal. The BMP’s may include catch basin hoods/deep sumps, vegetated swales, hydrodynamic separators, etc.

Additional measures and storm water routing will be developed as the design progresses.

Schematic Utility Services

Water mapping indicates that the library is served by an existing water main that is located along Tunxis Avenue (Route 189). New fire protection and domestic services are proposed to connect into this main along with a new meter pit to be coordinated with the Metropolitan District. Existing
services are also located on the 6 Mountain Avenue parcel which will have its existing building demolished. Existing water services shall be cut and capped with a new gate valve located at the property line.

Gas mapping indicates that the gas meters are located along a brick retaining wall on the eastern side of the existing library. These will be removed and the service cut and capped to the property line. New proposed service shall be coordinated with Connecticut Natural Gas (CNG), and it is assumed that the new service shall come off the main located within Tunxis Avenue and be brought to the new meter located at the proposed building. As part of the building being demolished at 6 Mountain Avenue, the gas service shall be coordinated for removal with Connecticut Natural Gas (CNG), cutting and capping the service at the property line unless otherwise indicated by the utility authority.

The 24” RCP sanitary sewer trunk line runs through the existing library property south to north adjacent to the Wash Brook. This main shall be protected and maintained, and existing service shall be cut and capped prior to the main to maintain its integrity. Proposed service from the new building is assumed to take the sanitary from the building as well as the below building parking lot drainage per the building code. An oil/water separator will be located within the parking garage. All structures shall be rubber gasketed and waterproofed to protect it from floodwaters. The existing sanitary sewer connecting the existing building to be demolished on the 6 Mountain Avenue parcel shall have its lateral removed and a concrete plug installed in its place within the existing sanitary manhole located along the frontage of the property.

**Materials:**

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<tr>
<th>Domestic Water and Fire Protection Piping</th>
<th>Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end, AWWA C110, ductile- or gray-iron standard pattern, thickness class 54. Shall meet The Metropolitan District standards. All joints shall be restrained with mechanical retainer glands and tie rods with Mega-Lug type clamps, or approved equivalent. Gaskets: AWWA C111, rubber. Detectable warning tape shall be installed over the piping.</th>
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<tr>
<td>Sanitary Manholes</td>
<td>Precast Manhole: ASTM C 913; designed according to ASTM C 890 for A-16 (ASSHTO HS20-44), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for sealant joints. Minimum diameter of 4 feet. Shall meet The Metropolitan District standards. Joint Sealant: ASTM C 990, bitumen or butyl rubber.</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
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<tr>
<td>Resilient Pipe Connectors</td>
<td>ASTM C 923, cast or fitted into manhole walls, for each pipe connection. Frame and Cover: 24-inch ID by 7- to 9-inch riser, with 4-inch-minimum-width flange and 26-inch-diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to &quot;SANITARY SEWER&quot;. Material: ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicate.</td>
</tr>
<tr>
<td>Storm Manholes</td>
<td>Precast Manhole: ASTM C 913; designed according to ASTM C 890 for A-16 (ASSHTO HS20-44), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for sealant joints. Minimum diameter of 4 feet. Joint Sealant: ASTM C 990, bitumen or butyl rubber. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection. Frame and Cover: 24-inch ID by 7- to 9-inch riser, with 4-inch-minimum-width flange and 26-inch-diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to &quot;STORM&quot;. Material: ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicate.</td>
</tr>
<tr>
<td>Catch Basins</td>
<td>Precast Concrete Catch Basins: ASTM C 913, precast, reinforced concrete; designed according to ASTM C 890 for A-16 (ASSHTO HS20-44), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for joint sealants.</td>
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<td>Yard Drains</td>
<td>Cast-Iron Area Drains: ASME A112.6.3 gray-iron square body with anchor flange and square grate. Top-Loading Classification: Heavy Duty.</td>
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Mechanical, Electrical, Plumbing & Fire Protection Narrative

I. EXECUTIVE SUMMARY

RZ Design Associates has been retained by TSKP Studio to provide a design for the mechanical, electrical, plumbing and fire protection systems for the new Prosser Library in Bloomfield, CT. The new building will be located at 1 Tunxis Ave. The new building will be approximately 38,000 ft². This study includes recommendations for Heating, Ventilation and Cooling, Plumbing, Fire Protection and Electrical Systems.

II. APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be provided in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

A. 2018 Connecticut State Building Code
C. 2015 International Mechanical Code
D. 2015 International Plumbing Code
F. NFPA, All applicable code sections, Latest Version
G. ASHRAE 90.1-2010
H. ASHRAE 62.1
I. 2017 National Electric Code

III. PLUMBING SYSTEMS

1. A new 3-inch domestic water service shall be provided to serve the domestic water demands of the facility. The new domestic water service shall be supplied from the existing water main in the street. The new water service equipment shall include water meter, isolation valves, pressure reducing valve, reduced pressure backflow preventer, strainer and bypass and shall meet all current code requirements and the requirements of the MDC. This new water meter assembly shall meter all water use for the entire library.

2. Domestic hot water, cold water and re-circulating hot water piping shall be provided to serve the plumbing fixtures and equipment throughout the building. All domestic piping shall be Type L copper conforming to ASTM B 88 with sweat fittings using 95/5 solder. All domestic water piping shall be insulated with rigid molded, noncombustible glass fiber insulation conforming to ASTM C335. All domestic water piping throughout the building shall be installed above ceilings and concealed within wall cavities.

3. A high efficiency electric heat pump style hot water heater shall be provided for the domestic hot water.

4. New sanitary, waste, and vent piping for all new plumbing fixtures. Sanitary, waste and vent piping shall be plain end cast iron with stainless steel clamp and shield assemblies conforming to ASTM B 42 for above ground piping. Buried piping shall be ASTM D2665 PVC with solvent cement joints conforming to ASTM D2855 with ASTM D2564 solvent cement. All sanitary waste and vent piping shall be concealed within chases and walls where ever possible. Waste services shall exit the building below slab at multiple locations to be
coordinated with the civil engineer. All sanitary waste shall be piped to the municipal waste water systems. Vent piping shall exit the building through the roof with a 4” diameter pipe and shall extend a minimum of 12” above the finished roofline.

5. Area drains shall be installed in the parking garage and routed to an outside oil interceptor by others.

6. Roof drains shall connect to rain leaders internal to the building and shall tie into storm mains at the lower level and shall connect to the general storm water system serving the remainder of the site. Secondary roof drainage shall be provided from overflow drains at the roof and shall terminate at a location visible to the building’s maintenance staff. Backwater valves shall be provided on all storm mains as they exit the building.

7. A new natural gas meter and pressure regulator sized to provide the new total connected load and pressure requirements for the library equipment. New piping within the building shall be installed to supply gas to the new hot water heating boilers, and new mechanical equipment. Natural gas piping shall be Schedule 40, ASTM A53 black steel with ASME B16.3 or ASTM A234 fitting with threaded joints for piping 2” and smaller and welded joints for piping 2-1/2” and larger. Installation of the natural gas system shall conform to the requirements of the Connecticut Gas and Equipment Code and NFPA 54.

8. Building will be LEED certified. All fixtures will be low flow. Additional metering will be provided for the domestic hot water system.

9. All plumbing fixtures required to be accessible shall be in accordance with the Americans with Disabilities Act (ADA), 504 and UFAS standards.
   a) Water closets shall be wall hung, vitreous china, low consumption (high efficiency 1.28 gallon per flush water closets), by American Standard or approved equal. Flush valves shall be sensor operated, by Sloan or approved equal.
   b) Lavatories shall be wall hung type, vitreous china, by American Standard or approved equal. Faucets shall be low consumption battery operated, by Symmons or approved equal.
   c) ADA sinks in shall be countertop mounted, stainless steel with offset drain fittings as manufactured by Elkay or approved equal. ADA compliant faucet with extra long single lever handle and swing spout shall be provided and shall be as manufactured by Symmons or approved equal.
   d) Wall hangers for water closets and lavatories shall be heavy duty adjustable height type installed within chase spaces provided behind fixtures, by J.R. Smith or approved equal.
   e) Water coolers shall be stainless steel, two-tier, ADA style, vandal resistant manufactured by Elkay or approved equal.
   f) Mop basins shall be floor mounted, 24”x24”, molded stone, with wall mounted faucet & trim, by Fiat or approved equal.
   g) Cast iron floor drains shall be installed at all group toilet rooms. Heavy-duty cast iron floor drains shall be installed in all mechanical rooms. Floor drains shall be by J.R. Smith or approved equal. Trap guards shall be provided for floor drains.
   h) All roof areas shall have primary/secondary roof drains by J.R. Smith, cast iron, with dome strainer or approved equal.
   i) Lockable hose bibs with vacuum breakers shall be installed in all group toilet rooms, by Woodford or approved equal.
   j) Lockable wall hydrants with vacuum breakers shall be installed on exterior walls every 100 feet. Wall hydrants shall be non-freeze type by Woodford or approved equal.
V. FIRE PROTECTION SYSTEMS

General Requirements

1. The fire protection design and installation will comply with all State and Local code requirements and the National Fire Protection Association (NFPA) Standards 13 and 25; applicable editions as referenced in the Connecticut State Building Code and subsequent amendments.

a) The sprinkler system piping layouts will be designed per hydraulic calculations in accordance with NFPA 13, the Owner’s insurance company requirements and any other requirements set forth by the local Fire Marshal.

b) The sprinkler systems will be hydraulically designed by occupancy as follows: All book storage and stack areas shall be designed to Ordinary Hazard Group II at 0.20 GPM per S.F. over 1500 S.F. Other Storage, Mechanical or Utility Rooms shall be designed to Ordinary Hazard Group I at 0.15 GPM per S.F. over 1500 S.F. The design criteria for the dry-pipe sprinkler system in the Parking Garage shall be Ordinary Hazard Group II at 0.20 GPM per S.F. over 1500 S.F. All other area shall be installed to Light Hazard with the 0.10 GPM per S.F. over 1500 S.F. design criteria.

c) A current hydrant flow test will be conducted in accordance with NFPA 291 and will be the basis of design for the sprinkler systems. Sprinkler Shop Drawings will be prepared following the bid of Construction Documents by the successful Bidder. The shop drawings and hydraulic calculations will be submitted to the Town’s insurance underwriter and local officials for approval prior to installation. The shop drawing will also be incorporated into a set of coordination drawings to insure adequate space for equipment and components of all trades.

d) The Fire Protection Contractor will be responsible for the piping layout to the sprinkler heads and the engineering work involved in the preparation of hydraulic calculations. Shop drawings will be prepared for approval by the owner’s insurance underwriter and the authority having jurisdiction. This documentation will be prepared by a NICET Level IV Certified Sprinkler Technician or contractor’s designer under the direct supervision of a Professional Engineer licensed in Connecticut, and be reviewed by the Project Engineer.

2. Seismic restraints will be provided in accordance with Connecticut State Building Code per the requirements of NFPA 13.

VI. Water Supply

1. A new 6” fire protection water service will be run from the existing 12” MDC water main in Tunxis Ave to the Valve Room at the parking level on the North side of the new Library. All fire protection work will terminate 5'-0" outside the building with all work outside the building to be covered under the civil/site contract.

a) The municipal water supply shall be protected by double check valve type backflow preventer in accordance with the Public Health Code. Provision for flushing with annual certification will be included.
VII. **Sprinkler Systems**

1. The building will be protected by both wet-pipe and dry-pipe sprinkler systems.

   a) The building is two story with partial basements and semi-open parking garage beneath part of the first floor. The two floors of library will be served by a wet-pipe system. The Parking Garage will be served by a dry-pipe system.

   b) There is a porch the full length of the South facade that requires protection. The structural configuration will determine whether dry sidewall sprinklers or a dedicated dry-pipe sprinkler system will be utilized for coverage of the outside occupancy.

2. System components and layout will be as follows:

   a) The fire department connection can be either a Storz or Siamese type connection. Type will be confirmed during design, with hose thread/type double checked when submittals are prepared for approval. Location will be determined in conjunction with the authority having jurisdiction.

   b) Fire Protection Water Service Entrance will be in the basement valve room with a manifold Fire Protection Riser. The manifold will have a single riser check valve with flow switch serving the entire wet-pipe sprinkler system and dry-valve assemblies serving the required dry-pipe sprinkler systems.

   c) A Fire Department line will be run from the Fire Department Connection and be tied into the manifold ahead of the individual riser control valves. Also, there will be a Test Connection Line run to a hose valve manifold at a location suitable for flushing the backflow preventer. All control valves on the Fire Protection Riser and at other locations in the building will be supervised by the Fire Alarm System.

   d) The Wet-Pipe Sprinkler System will be zoned by floor. Floor Control Assemblies incorporating an indicating butterfly control valve, flow switch, inspector’s test and section drain valve will be located in the North Stair. These control valves and the Fire Protection Riser valves will be supervised by the Fire Alarm System.

VIII. **Materials**

1. Piping will be ASTM A795 Schedule 10 black steel with roll grooved/Victaulic coupling joints for 2-1/2” and larger and ASTM A 795 Schedule 40 standard weight black steel pipe with ASME B16.1 threaded fittings for 2” and smaller. Piping for dry pipe system shall be Schedule 40 galvanized steel.

   a) Auxiliary drains will be provided as necessary. All dry-pipe sprinkler piping shall be pitched to drain as required by NFPA 13. Drum Drips will be provided as necessary.

2. Sprinkler heads shall be concealed type, fully recessed in finished areas with acoustical ceiling panels, sheetrock ceilings or specialty finishes. Cover plates shall be white unless required to match other finishes. Flexible type with stainless steel hose drops or return bends will be provided to tile centered or align heads to ceiling fixtures or elements. Sidewall type heads and upright type heads shall be utilized in open ceiling areas with standard brass finish where appropriate. Exterior sprinklers shall be chrome plated.
IX. MECHANICAL SYSTEMS:

General Mechanical

1. Heating, air conditioning and ventilation will be provided for the entire facility. The system will be designed to provide 75 °F during cooling and 70 °F during heating. Ventilation and exhaust will be provided in accordance with the current Connecticut State Building Code (2015 International Mechanical Code) and ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality. Ductwork will be sized in accordance with the acoustic consultant’s recommendations with a maximum of 0.8” pressure drop per 100 feet of ductwork; piping will be sized for a maximum head loss of 4 ft per 100 feet of piping.

2. This will be a LEED credited project and measures will be taken to achieve this including energy metering, demand control ventilation, MERV 13 filtration, refrigeration management, acoustic considerations and enhanced thermal comfort.

3. The Variable Refrigerant Flow (VRF) system will be provided with dedicated system controls that shall provide temperature control for the terminal units. The VRF controls system shall be integrated with the BMS system for monitoring and temperature override control.

4. The history collection area will have its own dedicated steam humidifier.

5. A Building Management System (BMS) will be provided to control and monitor mechanical and electrical systems.
   a) The BMS system shall include a dedicated computer with custom graphics display, color printer, modem and be capable of controlling from a remote location.
   b) The BMS shall provide temperature control for all HVAC systems with exception to the VRF terminal units and condensers. The BMS shall monitor the VRF system and have temperature setpoint capabilities.
   c) The system shall be programmed for occupied/unoccupied control for the dedicated outdoor air handling equipment, as well as an override feature for spaces that would be used when the system is typically inactive.
   d) The BMS shall be available from any Web browser, given that proper authorization is achieved.

X. Cooling Plant

Variable Refrigerant Volume and Dedicated Outdoor Air Handling Unit

1. The cooling for the building will be done with a Variable Refrigerant Flow (VRF) system. The system should include a 5,800 cfm dedicated outdoor air system (DOAS), Valient model VXE-212 or equivalent, with a DX cooling coil and a hot glycol heating coil. The condenser for the DX coil will be remote mounted on the roof. The DOAS unit will be ducted directly into the VRF terminal units, and provide ventilation air to the spaces. The DOAS will exhaust from the toilet rooms as well as general exhaust in the space, and have an enthalpy wheel to recover the energy from the space. Duct smoke dampers and smoke detectors will be located at each shaft penetration, and communicate with the fire alarm system.

2. Mounted on the roof will be approximately 52 Tons of air cooled roof mounted VRF heat recovery condensing units Mitsubishi model PURY or equivalent. There will be a total of 4 VRF condensing units, and 1 condensing unit for the DOAS dx coil. The VRF condensers will be piped to heat recover boxes located inside the building, which are then piped to the indoor
terminal units. The heat recovery boxes will have a dedicated condensate drain and connect to the nearest sanitary drain.

3. The indoor spaces will be served by a combination of concealed ducted and cassette type indoor terminal units, Mitsubishi model PEFY, PLFY or equivalent. The indoor units will be capable of both heating and cooling. The units shall be supported from adequate structure and proper access provided for service and maintenance. A temperature sensor shall be provided for each indoor unit to maintain individual control. The indoor units will each have a condensate drain line and connect to the nearest sanitary drain.

4. The elevator machine room will be served with an in-line exhaust fan, and reverse acting thermostat. An automated control damper shall be provided for both the outdoor air and exhaust ductwork. An alarm shall be sent to the BMS upon failure of the exhaust fan. Data/IT rooms will be served with a ductless split system, that will consist of a wall mounted indoor unit, and piped up to a remote condenser on the roof.

XI. Heating Plant

Condensing Gas Boilers

1. The heating plant will consist of three wall mounted gas fired boilers, Lochinvar model WHB110N or equivalent. The boilers will be arranged in a primary, secondary loop configuration and the fluid will be hot water with 40% propylene glycol. The primary pumps will be a factory provided 10 GPM constant speed circulating pump, model UPML-110 or equivalent and the secondary pumps will be fully redundant 30 GPM in line pumps, Bell and Gossett ECO XL 55-45 or equivalent, that each have a dedicated VFD. The pumps will distribute hot glycol to perimeter radiators, cabinet unit heaters and the DOAS heating coil. The boiler will operate on an outdoor air reset schedule, reducing the boiler temperature as the outdoor temperature rises. The boilers will each have exhaust and intake pipes and be vented out the side of the building.

2. The perimeter spaces with large window areas will be served with pedestal fin tube radiators to offset the heating loss. Vestibules and stairwells will be served with cabinet unit heaters and perimeter mechanical spaces will be served with unit heaters.

3. Primary heat in the spaces will be done with the VRF terminal units. When additional heat is required, the baseboard radiators will supplement the VRF system.

XII. Materials and Methods:

1. General:
   a) The mechanical contractor shall furnish and install all temperature control wiring, interlock wiring and equipment control wiring for the equipment furnished under this division.
   b) All work shall be carried out in conjunction with other trades and full cooperation shall be given in order that all work may proceed with a minimum of delay and interference.
   c) After completion of the work, but before substantial completion, test, adjust and balance all air and water systems in accordance with either AABC, NEBB, or TABB standards.
   d) Provide a complete set of as-built drawings reflecting as installed conditions. As-
built drawings shall indicate all installed conditions of systems within this discipline. Drawings shall be of similar scale as the construction documents and include details as necessary to clearly reflect the installed condition.

e) Firestopping shall be provided around mechanical penetrations in accordance with fire stopping requirements. System shall be capable of maintaining against flame and gases, shall be UL listed and comply with ASTM E814.

f) Building will be designed to meet the minimum ventilation requirements of the current ASHRAE 62.1 using the Ventilation Rate Procedure for mechanical systems.

2. Ductwork:
   a) Ductwork shall be fabricated from hot-dipped galvanized steel sheet conforming to ASTM a653, with g60 coating. Exhaust ductwork serving toilet/shower spaces shall be aluminum sheet alloy 3003-h14, ASTM b 209, aluminum connectors and bar stock: alloy 6061-t6 or of equivalent strength.

   b) Fabricate, support, install and seal in accordance with SMACNA HVAC duct construction standards - metal and flexible, and as indicated. Provide duct material, gauges, reinforcing and sealing for operating pressures indicated.

   c) Access doors shall be provided under this section as required to provide access to fire and smoke dampers, controls, humidifiers, coils alves, etc., which are located in ducts.

   d) Faced fiberglass duct wrap shall be applied externally to all concealed ducts in accordance with manufacturers instructions. Duct wrap to be 1.5 pcf density with k value of 0.27 at 75 deg f, equal to Owens Corning type 100 or equivalent.

   e) Apply 1" acoustical duct liner and liner board to the inside of ducts and plenums as specified and as called for on drawings. Acoustical liner shall be 2.0 pcf density with k value of 0.26 at 75 deg f, equal to Manville permacote linacoustic-hp or equivalent.

3. Hot Glycol Piping
   a) Schedule 40 black steel pipe conforming to ASTM a53, with welded, threaded or grooved joints.

   b) Fittings: ASTM a234 wrought steel welding type fittings, ASTM b16.3 malleable iron threaded fittings, or grooved fittings and mechanical couplings

   c) Fittings 2" and under shall be threaded, fittings 2-1/2" and over shall be welded or grooved.

   d) Piping 2" and smaller may be ASTM b88 type k drawn copper with soldered fittings or copper press fittings.

   e) Provide rigid molded, noncombustible fiberglass pipe insulation with white kraft paper vapor barrier jacket and self-sealing lap joint and butt strips. Insulation shall be 1.5 pcf density with k value of 0.24 at 75 deg f. Insulation shall be rated for operating temperatures from 0 deg f to 850 deg f and be equivalent to Owens Corning ASJ-SSL II or equivalent.

   f) Fittings shall be covered with flexible fiberglass insulation and zeston pvc fitting covers. Insulation thickness shall be in conformance with the international energy code.

   g) All insulation materials, including jackets and adhesives, shall meet the requirements of NFPA 90a, according to ASTM test e-84, NFPA 255 and ul 723, having a flame-spread rating of not over 25, a smoke-developed rating of not over 50 and a fuel-contributed rating of not over 50.
4. Refrigerant Piping
   a) Drawn (rigid) copper tube shall be type ACR, r410 rated, ASTM b280, h58 temper, clean, dry and capped. Fittings shall be ASME b16.22 wrought copper. Joints shall be brazed with AWS a5.8 bcup silver / phosphorus / copper alloy.
   b) Annealed (soft) copper tube shall be type acr, r410 rated, ASTM b280, o60 temper, clean, dry and capped. Fittings shall be ASME 16.22 wrought copper. Joints shall be flared or brazed with AWS a5.8 bcup silver / phosphorus / copper alloy.
   c) Insulation shall be flexible elastomeric. Insulation thickness shall be in conformance with the international energy code.

5. Low Pressure Condensate:
   a) Pipe: schedule 80 black steel pipe conforming to ASTM a53, with welded or threaded joints.
   b) Fittings: ASTM a234 wrought steel welding type fittings or ASTM b16.3 malleable iron threaded fittings.
   c) Fittings 2" and under shall be threaded, fittings 2-1/2" and over shall be welded.

6. Pipe Hangers and Supports
   a) All hanger, support and anchor types or model numbers specified herein are based on Grinnell or acceptable equivalent. Supports shall conform to mss-sp-69 and ANSI b31.1. Wire and/or strap hangers will not be acceptable.
   b) Hangers for pipe sizes two (2") inches and smaller shall be light-duty, clevis-type hangers, #65. For copper pipes two (2") inches and smaller, use ct-69 copper band hangers or ct-65 copper plated clevis.

XIII. ELECTRICAL SYSTEMS

   Electrical Service

1. A new electric service installation for the project will be required. Coordination with the local utility company will determine the best possible point of origin and the main point of entry into the building. At this time it is assumed the installation can be configured at the north end of the building and will require a new pad mounted utility transformer on site. Any equipment that may be required by the utility company will be coordinated for installation at a location preferred by the Architect, Utility Company, and Civil Engineer. The preferred electric service characteristics would be 208Y/120V-3 phase 4 wire with capacity to support 1,600 amperes. Any existing electric services shall be removed.

2. The new building shall be approximately 27,000 square foot in size with anticipated load density to be a minimum of 15 watts/square foot. The new electric service design will promote a single metered tenant account.

3. The new electric service equipment shall feature a Main Distribution Switchboard (MDS) with an electronic trip type main circuit breaker in cold sequence with a utility metering cubicle, circuit breaker branch distribution and a main surge protective device, all mounted in a dead front freestanding enclosure on a 4" housekeeping pad. The MDSB shall be located in the Electric Room at the Garage level of the building.
All the circuit breakers in the Main switchboards shall be provided with active power monitoring connections to the building management systems. The system shall include the following:

a) A new underground service entrance feeder from the Utility origination point to the MDSB with (6) sets of 4#500 KCMIL in (5)-4” schedule 40 PVC conduits, (5) active & (1) Spare. When crossing roadways, sidewalks, etc, concrete encased conduit shall be provided.

b) Grounding & Bonding shall be provided as required per NEC

c) All conductors shall be copper.

4. The building shall have solar panels mounted on roof (design by others). Provide (3) - 4” Conduits from roof to Main electrical room for interconnection between solar system & breaker assigned for it in the Switchboard.

XIV. Electrical Distribution

1. The building shall be provided with panelboards and feeders arranged to efficiently distribute power to key areas of the building and its equipment. This shall include but not be limited to: Elevator, HVAC, Plumbing equipment, lighting, receptacles, data telecommunications network equipment, security equipment, fire alarm equipment, AV, sound system and technology equipment, etc.

2. Branch circuits shall be installed in EMT conduit. EMT conduit shall be used to the first device in a branch circuit and shall be used in all masonry or CMU partitions. Type MC cable shall be allowed but limited to concealed spaces above finished ceilings or in drywall type partitions after EMT connection has been provided to the first device. The following provisions shall be included:

a) Electrical Outlets shall be provided as required based on furniture layout & programming requirements. Refer to SD plans for preliminary Layout of electrical fixtures.

b) Circuits for all HVAC equipment as required. 120 volt wiring to control panels, control transformers, etc shall be provided by the electrician while low voltage control wire shall be provided under Division 23.

c) Circuits for all plumbing equipment.

d) Circuits for the Fire Alarm, Access Control, Surveillance, Data Network, Audio/Sound and Security equipment shall be provided as required.

e) Circuits for office equipment as required.

f) Circuits for electric water coolers as required.

g) Duplex tamper resistant receptacles every 20'-0" in corridors for housekeeping.

h) Circuits for elevator power and associated lighting and control wiring. This shall include elevator specific shunt trip requirements.

i) Maintenance GFCI and weatherproof outlets located on the roof within 25ft of HVAC rooftop equipment.
j) Exterior wall mounted outlets where directed by the owner.

k) Boiler emergency shutdown buttons will be located at the door(s) to the boiler room.

XV. **Lighting Systems**

1. Typical design illumination levels for ambient lighting shall include:
   a) 15fc average – Corridors, toilet rooms, storage rooms and stairways
   b) 35 - 50fc average – Community Room, Adult Area, Teen Center, Learning Lab, Children’s Area, offices and utility rooms.
   c) 30fc average – All other areas not listed above

2. The following fixtures will be provided:
   a) 12'-0" or 16'-0" long pendant mounted direct/indirect decorative linear LED fixtures with extruded aluminum housings to be installed in areas without ceilings having exposed structure. Quantities of fixtures shall be designed to provide the requisite footcandle levels. Fixtures will be arranged parallel and perpendicular to building lines and normally parallel to the largest area of vertical fenestration to promote daylight harvesting design.
   b) Direct/indirect volumetric style acrylic lensed 2’ x 2’ recessed mounted LED fixtures will be designed in office/work areas, and other select areas with acoustical tile suspended ceilings.
   c) 2’ x 4’ recessed LED fixtures on 8x8 centers in large rooms with acoustical tile suspended ceiling.
   d) 2’ x 2’ recessed LED fixtures on 12'-0" centers in corridors.
   e) Perimeter mounted recessed linear LED light fixtures in all bathrooms.
   f) 4-foot industrial LED fixtures with wire guards in all electric rooms, mechanical spaces and unfinished areas without suspended ceilings.
   g) Accent, exterior building mounted, and feature lighting that has aesthetic appeal to directly compliment the architecture will be provided as selected by the Architect, in areas such as corridors, main lobby, exterior facade, etc.

3. Daylight sensors and dimming control shall be provided in all open areas with sufficient daylight contribution to promote daylight harvesting as required by the applicable energy conservation code requirements. Any rooms that have applicable vertical fenestration that exceeds 30% of the total wall area shall be considered daylight zones. Fixtures within 15'-0” of the fenestration shall be dimmed via a daylight sensor. The remaining rows of lights will have the ability to be manually step-dimmed to 50% light output by the occupants via a momentary pushbutton switch. There will be one master on/off toggle switch for all the lighting in select rooms. This will allow turning off the lights and overriding the sensors. Multi-zone controls for the scenario outlined above will be facilitated by the design of a local stand-alone lighting control module.

4. Occupancy sensors shall be provided in all lit areas except in utility rooms and other rooms or areas exempted by code. Controls shall be either auto-on (occupancy mode) or manual-on (vacancy mode) depending upon the room application. Lighting will initially operate up to
50% of total brightness and the occupant will be required to manipulate controls for full brightness, if desired.

5. Corridor and stairwell lighting shall remain on during occupied hours, but will be controlled by occupancy sensors during unoccupied times. This will require communication with the building management system.

6. All lighting fixtures specified shall be those recognized and listed with the Design Lights Consortium (DLC), wherever possible.

7. All egress doors shall have emergency egress illumination for the area of exit discharge as determined by the egress code analysis plan. Exterior lighting will be provided at each egress door. Typical fixture shall be LED with remote mounted battery ballast.

8. Emergency lighting shall be accomplished using emergency inverters/batteries installed integral to selected lighting fixtures to promote minimum .1 footcandles illumination along all paths of egress. Where integral emergency batteries are not practical for the lighting fixtures in a certain area, self-contained emergency twin lamp style fixtures or an external inverter providing AC power to the light fixtures, will be provided.

9. Exit signs will be self-contained, universal mounted, LED illuminated, edge-lit, low energy usage fixtures with integral emergency batteries.

10. Illuminated exit signs with the International Symbol of Accessibility shall be provided where required by code.

XVI. **Low Voltage Systems**

1. (3) 4°C will be provided for incoming Telephone, Fiber Optic (at Owners request) and Cable Television services, including one spare conduit for future use.

2. Raceway, power and grounding provisions will be provided throughout the building in conformance with all requirements of the owner furnished low voltage communication and monitoring systems. The systems shall include: data network, fiber optic distribution, copper telephone distribution, coax video or cable TV distribution, audio-visual systems, access control/card reader systems, surveillance camera systems, security/intrusion detection systems. We are anticipating that the owner will make available progress drawings of each specific low voltage system noted above that identifies major components and point of use for coordination by the engineer.

3. Single stall toilets will be provided with local emergency call for aid system that includes pull cord and buzzer/light mounted above the door to the toilet.

XVII. **Fire Alarm System**

1. The building will be provided with an intelligent addressable type fire alarm system in compliance with code requirements and ADA regulations. Horn/strobe style annunciation will promote evacuation throughout the building. The system shall be provided with a fire alarm control panel to contact the preferred Central Station monitoring company through a digital dialer. Manual pull stations shall be installed in the egress paths at exterior doors and at entrances to stairwells. Audible and visual signaling devices shall be installed in all habitable rooms, corridors, toilets, etc. Visual-only signaling devices shall be installed in all conference rooms, work rooms, etc. The system shall include the following equipment:

2. Remote annunciator mounted at main entry doors or at the preferred location of the local Fire Prevention Bureau.
3. Horn/strobe indicating appliances will provide occupant notification in conformance with NFPA 72 with approximately one device per room.

4. Smoke detection shall be provided in all storage rooms and any rooms that are infrequently used. Heat detection will be provided in the boiler room via 190 degree detectors.

5. Manual pull stations at ends of corridors, egress doors, and no further apart than 200 feet.

6. Monitoring modules for sprinkler tamper and flow switches and also Dry System Compressor status monitoring.

7. (2) Duct smoke detectors for each air-handling unit (Capacity >=2,000 cfm), (1) in the supply, and (1) in the return duct.

8. Signal to BMS system for fan shut-down, and damper actuation on alarm condition.

9. (2) dedicated phone lines for fire alarm panel central station communication extended from the telephone demarcation board.

10. All fire alarm system wiring will be fire alarm MC cable. EMT conduit with type THHN wire shall be provided where exposed. Metal clad cable shall be allowed where concealed.

11. Carbon Monoxide detectors in rooms or just outside rooms where fossil fuels are being burned such as the boiler room.

12. Smoke and heat detectors shall be utilized for elevator power source shunt trip and elevator recall functions.

XVIII. Materials and Methods

1. Include the following basic materials and methods of construction:

   a) Wiring will be THHN/THWN copper, installed in EMT conduit to first device or exposed and MC cable for and remainder of circuit, and concealed work.

   b) Receptacles shall be specification grade, NEMA 5-20R etc.

   c) Disconnect switches will be fusible heavy-duty type. NEMA 1 or 3R as required for the installation location.

   d) Circuit breakers will be fixed element, thermal magnetic type (Size <225Amp Rating).

   e) Circuit breakers >225Amps shall have Adjustable electronic trip settings.

   f) Panelboards will contain copper bussing, with hinged door-in-door trim.

   g) Branch circuit breakers shall be bolt-on type.

   h) All conduits, circuits and devices will be labeled.

   i) Conduits below slabs will be schedule 40 PVC, with rigid steel conduit sweeps.
PURPOSE AND DESCRIPTION OF PROJECT
A.) CONSTRUCTION OF A PROPOSED LIBRARY AND PARKING LOT.
B.) DISTURBED AREA: ±2.8 AC.

IDENTIFICATION OF EROSION AND SEDIMENT CONTROL CONCERNS
1. CUTS AND FILLS ASSOCIATED WITH CONSTRUCTION.

IDENTIFICATION OF OTHER POSSIBLE PERMITS
THE PERMITS REQUIRED FOR THE PROJECT ARE PLANNING AND ZONING, AND INLAND WETLANDS.

RESPONSIBLE PARTY
NAME: [Redacted]
COMPANY: [Redacted]
PHONE: [Redacted]

SOIL EROSION AND SEDIMENT CONTROL NARRATIVE
THE SEDIMENT AND EROSION CONTROL NARRATIVE SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CONNECTICUT - 2002, TOWN OF BLOOMFIELD STANDARDS, AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.

1. PURPOSE AND DESCRIPTION OF PROJECT
A.) CONSTRUCTION OF A PROPOSED LIBRARY AND PARKING LOT.
B.) DISTURBED AREA: ±2.8 AC.

3. ISSUE DATES
PURPOSE  NO. DATE

EROSION CONTROL LEGEND
- PROPOSED BUILDING
- PROPOSED PARKING AREA
- времена земной обертки
- SEDIMENT FILTER FENCE
- TEMPORARY SOIL STOCKPILE
- AREA SURROUNDED WITH SEDIMENT FILTER FENCE
- NRCS SOIL TYPES
- WASH BROOK
- FLOODWAY LIMIT
- FLOOD ZONE X
- FLOOD ZONE AE
- FIRE LANE
- NO PARKING
- PARKING AREA
- HAYBALES
- SEDIMENT AND SOIL EROSION AND SEDIMENT CONTROL NARRATIVE
- SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED WITHIN
SEDIMENT AND EROSION CONTROL SPECIFICATIONS

GENERAL:

1. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED AS VARIOUS SECTIONS OF THE PROJECT MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT. IN GENERAL, ALL FINAL GRADING HAS BEEN COMPLETED AND A PERMANENT COVER IS NEEDED.

2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.

3. PERFORM ALL PLANTING OPERATIONS PARALLEL TO THE CONTOURS OF THE SLOPE.

4. APPLY TOPSOIL AS INDICATED ELSEWHERE HEREIN.

5. ANCHOR WITH 2" X 2" X 3' STEAKS - (2) EACH BALE

6. WOODEN LATERAL - 2" X 4" WOODEN STAKES

7. NYLON ROPE,

8. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

9. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

10. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

VEGETATIVE COVER SELECTION AND MULCHING

1. TOPSOIL SHALL BE SPREAD OVER ALL EXPOSED AREAS IN ORDER TO PROVIDE A SOIL MEDIUM HAVING FAVORABLE CHARACTERISTICS FOR THE ESTABLISHMENT, GROWTH, AND MAINTENANCE OF VEGETATION.

2. TOPSOIL SHOULD HAVE PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS NOT TO SCALE

3. TOPSOIL SHOULD HAVE A SANDY OR LOAMY TEXTURE.

4. TOPSOIL SHOULD BE RELATIVELY FREE OF SUBSOIL MATERIAL AND MUST BE FREE OF LARGE STONES, LUMPS OF SOIL, ROOTS, TREE LIMBS, TRASH, OR CONSTRUCTION RESTRICTIONS AS APPROVED.

5. SOLUBLE SALT CONTENT OF LESS THAN 400 PPM IS REQUIRED.

6. THE TOPSOIL SHALL BE WARRANTED BY SELLER TO BE FREE OF DETECTABLE RESIDUES OF CHEMICAL PESTICIDES, HERBICIDES, PETROLEUM PRODUCTS, OR DETERGENT.

7. THE ENGINEER, HAY BALES WILL BE REMOVED AND USED AS MULCH. ANY SEDIMENTATION WILL BE THINLY SPREAD UPON ESTABLISHED GROUND COVER.

8. EXCAVATIONS SHOULD NOT BE MADE SO CLOSE TO PROPERTY LINES AS TO BLOCK DRAINAGE OR PROFIT FROM LEAVING THE SITE.

9. OTHER SEDIMENTS FROM LEAVING THE SITE.

10. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

11. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

12. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

13. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

14. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

15. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

16. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

17. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

18. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

19. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

20. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

CONSTRUCTION ENTRANCE PAD

1. IDEALLY BALES SHOULD BE ENTRENCHED 2 TO 4 INCHES AND TIGHTLY BUTTED TOGETHER.

2. BALES SHALL BE ONLY USED AS A TEMPORARY BARRIER AND FOR NO LONGER THAN 60 DAYS.

3. PLACE BALES SO BINDINGS ARE IN FIRST POSITION, THEN PLACE BALES TO PROTECT SENSITIVE AREAS.

4. COVER GRASS AND LEGUME SEED WITH NOT MORE THAN 1/4 INCH OF SOIL WITH STRAW.

5. SOLUBLE SALT CONTENT OF LESS THAN 400 PPM IS REQUIRED.

6. THE STRINGS SHALL BE WARRANTED BY SELLER TO BE FREE OF DETECTABLE RESIDUES OF CHEMICAL PESTICIDES, HERBICIDES, PETROLEUM PRODUCTS, OR DETERGENT.

7. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

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SEDIMENT FILTER FENCE

1. INSTALL A GEOTEXTILE SILT FENCE AND/OR HAY BALE BARRIER AROUND THE CONSTRUCTION WORK AREA.

2. MULCH IMMEDIATELY AFTER SEEDING IF REQUIRED. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATIONS. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATIONS.) APPLY STRAW AND ANCHOR TO SLOPES GREATER THAN 3%.

3. WIRING, BRACKETS, OR OTHER SUPPORTS MUST BE CAST IN CONCRETE OR OTHERWISE SECURED TO THE FENCE WITH A küHLSCHLEICHER Báo THỊ TRƯỜNG.

4. INSTALL PERIMETER CONTROL, SEDIMENT BARRIER, OR HAY BALES AROUND THE CONSTRUCTION WORK AREA.

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HAY SALE BARRIER PROTECTION

1. IDEALLY BALES SHOULD BE ENTRENCHED 2 TO 4 INCHES AND TIGHTLY BUTTED TOGETHER.

2. BALES SHALL BE ONLY USED AS A TEMPORARY BARRIER AND FOR NO LONGER THAN 60 DAYS.

3. PLACE BALES SO BINDINGS ARE IN FIRST POSITION, THEN PLACE BALES TO PROTECT SENSITIVE AREAS.

4. COVER GRASS AND LEGUME SEED WITH NOT MORE THAN 1/4 INCH OF SOIL WITH STRAW.

5. SOLUBLE SALT CONTENT OF LESS THAN 400 PPM IS REQUIRED.

6. THE STRINGS SHALL BE WARRANTED BY SELLER TO BE FREE OF DETECTABLE RESIDUES OF CHEMICAL PESTICIDES, HERBICIDES, PETROLEUM PRODUCTS, OR DETERGENT.

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PROGRESS C3.1
TYPICAL DETENTION BASIN

FORMATION OF EMBANKMENTS FOR STORMWATER BASINS

1. MATERIALS

All fill materials shall be obtained from required excavations or designated borrow areas. The moisture content of materials in the embankment shall be controlled to meet the formation of embankments for stormwater basins.

2. MATERIALS AND METHODS

Materials shall be placed in layers and shall not exceed 12 inches in thickness for earth embankments. Any layer found too wet for proper compaction shall be allowed to dry before rolling. The material used in the center portion of the embankment shall be the most impervious material used in the outer portion of the embankment as shown on the plans.

3. PLACEMENT OF FILL MATERIAL

The fill shall be placed in lifts no greater than 12 inches thick. Each layer shall be thoroughly disked or harrowed to provide proper mixing. Any layer found too wet for proper compaction shall be allowed to dry before rolling. The material used in the center portion of the embankment shall be the most impervious material used in the outer portion of the embankment as shown on the plans.

4. CONTROL OF WATER

The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.

5. EMBANKMENT FOUNDATION PREPARATION

The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.

6. EMBANKMENT CONTROL OF WATER

The surface of the fill shall have a crown or cross-slope of not more than 1%. The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.

7. FINISHING EMBANKMENTS

The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.

8. EMBANKMENT MOISTURE CONTROL

All fill materials shall be obtained from required excavations or designated borrow areas. The moisture content of materials in the embankment shall be controlled to meet the formation of embankments for stormwater basins.

9. EMBANKMENT FORMATION

The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.

10. EMBANKMENT DAMAGED BY WASHING

The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.

11. IMPEDEMENT MATERIAND OTHER OBJECTIONABLE MATERIALS

The fill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The more pervious the fill, the more water it will absorb. The fill shall be compacted to 95% of the standard Proctor density at near optimum moisture content and by the compaction equipment specified herein. The compaction equipment shall traverse the entire surface of each layer of fill material. The fill shall be brought up uniformly and its top shall be kept uniform for the entire length of the slope.
1. TYPICAL ROOF CONSTRUCTION: 1 1/2" X 20GA. GALVANIZED TYPE "B" METAL ROOF DECK, PRIOR TO SUBMITTING SHOP DRAWINGS REFER TO GENERAL NOTES FOR FASTENING REQUIREMENTS.

INDICATES MOMENT CONNECTION, REFER TO TYPICAL DETAILS ON DRAWING S-601.
NOTES

NOTE: Applies to interior walls only.

AND BELOW BEAM BEARING TO MATCH WALL REINFORCING.

NEW COLUMN ANCHORS MASONRY C.J. LOCATIONS AFTER THE BEAM IS INSTALLED (TYPICAL) HEIGHT AT REINFORCING SIDE OF C.J. 0" (3/4"x4"x8" @ 6" CMU)

INTERMEDIATE PNEUMATIC (6" EMBED)

FIRE STOP PER ARCH'L.

METAL ROOF DECK 8" BLOCK (2)

- 3/4" = 1'-0" As indicated

1 1/2"Ø LONG VERTICAL MHAI

1. INTERSECTIONS

2. WALL PERPENDICULAR TO DECK SPAN

3. - 4" MASONRY 0" TO 10'

4. - 4" MASONRY 0" TO 10' - 0" 6" CMU GREATER THAN 20'

5/16X6" LONG BENT PLATE WITH DRILLED AND EPOXY 5/8"Ø THREADED ROD

ANCHOR WALL TO FLOORS AND ROOFS

INTERMEDIATE MASONRY WALLS, REFER TO GENERAL NOTES

NOTE:

GENERAL NOTES REINFORCING, REFER TO #9 WIRE LADDER TYPE HORIZONTAL REINFORCING @16"O.C. (SEE SPEC.) FOR OPENING

MATCH BOND BEAM BEARING PLATE WITH (2) NOTE:

(2) #5 CONT.

(2) 11/2"Ø LONG VERTICAL

NOTE:

TYPICAL CMU WALL REINFORCEMENT DETAIL

TYPICAL CMU REINFORCING PLAN DETAILS

TYPICAL TOP OF WALL MASONRY ANCHORAGE TO STEEL

TYPICAL BEAM TO MASONRY CONNECTION

TYPICAL DETAIL OF CMU PARTITION ON SUPPORTED SLAB

TYPICAL BEAM BEARING PLATE AT NEW CMU

TYPICAL THICKENED SLAB DETAIL

MASONRY Lintel Schedule

TYPICAL DETAILS

S-602
LOWER LEVEL MECHANICAL DUCT PLAN
ELECTRICAL SYMBOL LIST

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

ELECTRICAL GENERAL NOTES


ELECTRICAL REMOVAL NOTES

ALL EXISTING ELECTRICAL EQUIPMENT SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES. THE CONTRACTOR SHALL PROVIDE A COPY OF THE REMOVAL PLAN TO THE ARCHITECT AND THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL ELECTRICAL EQUIPMENT.

LIGHTING FIXTURE NOTES

1. LIGHTING FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE A COPY OF THE INSTALLATION INSTRUCTIONS TO THE ARCHITECT AND THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION OF ALL LIGHTING FIXTURES.

OVERHEAD DOOR NOTES

1. THE CONTRACTOR SHALL PROVIDE A COPY OF THE INSTALLATION INSTRUCTIONS TO THE ARCHITECT AND THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION OF ALL OVERHEAD DOORS.

ELECTRICAL DEMOLITION NOTES

THE CONTRACTOR SHALL REMOVE ALL EXISTING ELECTRICAL EQUIPMENT AND WIRING IN ACCORDANCE WITH THE APPROVED WORKING CABINET. THE CONTRACTOR SHALL PROVIDE A COPY OF THE DEMOLITION PLAN TO THE ARCHITECT AND THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL ELECTRICAL EQUIPMENT AND WIRING.

ABBREVIATIONS

- A
- B
- C
- D
- E
- F
- G
- H
- I
- J
- K
- L
- M
- N
- O
- P
- Q
- R
- S
- T
- U
- V
- W
- X
- Y
- Z
1. DO NOT USE REGULAR POWER RISER DIAGRAM.
2. OWNER'S POWER DISTRIBUTION CENTER IN E105 IN THE Mezzanine Level.
3. OWNER'S DISTRIBUTOR BOARD IN E105 IN THE Mezzanine Level.
4. OWNER'S DISTRIBUTOR BOARD IN E105 IN THE Mezzanine Level.
5. OWNER'S DISTRIBUTOR BOARD IN E105 IN THE Mezzanine Level.
6. OWNER'S DISTRIBUTOR BOARD IN E105 IN THE Mezzanine Level.
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30. OWNER'S DISTRIBUTOR BOARD IN E105 IN THE Mezzanine Level.
31. OWNER'S DISTRIBUTOR BOARD IN E105 IN THE Mezzanine Level.
March 2, 2022

Ms. Nancy P. Haynes
Purchasing and Risk Manager
Town of Bloomfield
800 Bloomfield Avenue
Bloomfield, CT 06002

Re: Geotechnical Study for Proposed New Prosser Library, 6 Mountain Avenue, Bloomfield, CT

Dear Ms. Haynes:

1.0 Herewith are the boring data pertaining to the above. Nine borings were drilled to a maximum depth of 29 feet below existing grade. The boring locations are shown on the attached plan. The borings were drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.

1.1 Laboratory testing included 5 water content tests and grain size gradation tests. The results of those tests are included in the Appendix.

2.0 The Subject Project will include the demolition and replacement of the Prosser Library. The new library will be a three story building with a footprint of 15,615 sf. The existing grades in the area of the proposed building range from about Elev.120 to Elev.111. The channel of Wash Brook appears to be at about Elev.106. The FEMA flood map (effective date 9/26/2008) indicates the river flood way in this area is up to Elev.115. The ground floor slab will be at Elev.115.5 on the east side of the building. On the west side of the building there will parking garage area with a floor at Elev.113. The site development will include the construction of a footbridge across Wash Brook to access the proposed parking area on west side of the brook. There will be a walkway on the south side of the building which will extend from the 1st floor building level at Elev.125.5 to the footbridge.

3.0 The Geologic Origin of the natural inorganic soils is from shallow glacial lake deposits atop glacial moraine deposits. The lake deposits consist generally of fine sand with trace to some silt, or varved silt with little clay. The moraine consist of medium compact to dense sand and silt with little to some gravel. There are localized alluvium deposits atop the lake deposits in the river flood plain.
The alluvium consists of silt and sand with trace to little gravel and organics.

3.1 The Soil Cross Section from the borings is generally as follows:

**Building Footprint (see borings B-1, B-2, B4 thru B6, B-8 & B-9)**

*Note: Borings B-3 and B-7 were not drilled due to possible conflicts with existing utilities.*

- Asphalt to 2" to 4" atop fine to coarse SAND and GRAVEL, little Gravel to 6" to 8"; or Topsoil 6"
- FILL; fine to fine to medium SAND, some Silt, trace Brick Fragments and Gravel; or fine to coarse SAND, little to some Silt and Gravel, trace Brick and Concrete Fragments to 3.5 to 9.5 feet, loose to medium compact
- Locally Alluvium; SILT, trace to little fine Sand and Organics; or fine SAND, little Silt to 6 to 8 feet, loose/soft
- Fine to fine to medium SAND, trace to little Silt; or varved SILT, little Clay to 8 to 13 feet, medium compact/medium stiff
- Moraine; fine to coarse SAND, some Silt and Gravel to auger refusal at 21+ to 29 feet below the existing grades, medium compact to very dense

3.2 The Water Table was evident at 5 to 9.5 feet below the existing grades at the completion of the borings. The water table levels will influenced by flooding in Wash Brook as cited in section 2.0 above. The capillary water in the silty soils can be 1 to 2 feet above the static water levels.

3.3 Estimated Soil Properties:

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Unit Weight (pcf)</th>
<th>Submerged Unit Weight (pcf)</th>
<th>Angle of Internal Friction (ø)</th>
<th>Cohesion (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FILL; fine to coarse SAND, little to some Silt and Gravel, trace Bricks and Concrete</td>
<td>120</td>
<td>58</td>
<td>28°</td>
<td>0</td>
</tr>
<tr>
<td>Alluvium; SILT, trace to little fine Sand and Organics</td>
<td>110</td>
<td>48</td>
<td>22°</td>
<td>0</td>
</tr>
<tr>
<td>Glacial Lake Deposits; SAND and SILT; or varved SILT, little Clay</td>
<td>115</td>
<td>53</td>
<td>22°</td>
<td>200</td>
</tr>
<tr>
<td>Moraine; fine to coarse SAND, some Silt and Gravel</td>
<td>130</td>
<td>68</td>
<td>34°</td>
<td>0</td>
</tr>
</tbody>
</table>
3.4 Regarding the varved silt and clay and the impact on building performance, this stratum varies in characteristics across the Connecticut River Valley. The silt/clay in the Bloomfield area tends to be somewhat more pre-consolidated by prior loading or possibly from periods of dessication with the depositing of the soil. Based on measurements at bridge abutments along Route 91, approximate average settlements appeared to be based on a value of \( a \) equal to 0.006 sf/ton x effective depth of stressed soil. Filling within the proposed building footprint would be up to 3.5 feet or about 450 psf. Assuming 450 psf (0.22 Tons/sf) and a depth of silt/clay at about 5 feet, the estimated maximum silt/clay consolidation would be less than 1/8”.

4.0 The Criteria for Foundation Type and Loading are as follows:

1. The maximum total settlement should not exceed 3/4” and the maximum differential settlement should not exceed ½ the maximum settlement.

2. The Foundations and Structures must address the seismic section of the building code

3. The Slab at Grade floors must not settle differentially more than ½” in excess of the structure subsidence.

4.1 Regarding item 2 (above), the seismic site soil profile classification is “D”. The mapped MCE spectral response acceleration values for Bloomfield, CT are \( S_1 = 0.064 \) for one second period and \( S_8 = 0.180 \) for short period. For transfer of ground shear into the soil the ultimate friction factor can be 0.60.

5.0 Regarding the Foundation Type the foundations for the proposed building could be with spread footings. The footings could be on (1) a controlled/structural fill placed after the removal of any existing fills and organic/alluvium deposits or (2) on ground improvement with aggregate piers. Controlled fills should conform to section 6.0 below and should extend outside of foundations for a distance equal to at least the depth of fill beneath the foundations. Where atop a wet subgrade the fill should be with crushed 3/8” stone. Based on the borings the alluvium deposits extend to 6 to 8 feet below the existing grades (Elev.103 to Elev.106) and 2 to 3 feet below the current water level. It is recommended that there be a minimum 18” layer of 3/8” crushed stone atop a geotextile (Mirafi 500X, or equal) as an initial layer beneath controlled fills. The ground improvement with aggregate piers would be a design build item. The piers would support the foundation and floor slab. The piers are usually installed from a level elevation across a building pad. The ground improvement would mitigate the requirements for removal of the fills beneath the building foundations and floor slab.

5.0.1 The excavations to the sub grades for removal of the existing fills and organic soils should be made with a smooth edged bucket to minimize disturbance to the soils. Back-blading of the subgrade soils should be avoided.

5.1 The Allowable Bearing Pressure on the controlled/structural fill or on the aggregate piers can be 4,000 psf. The allowable loading can be increased by 1/3 for seismic or wind loading. At
retaining walls the maximum pressure on the toe can be 50% higher than the average pressure, cited above.

5.2 The static **Lateral Soil Loading** on retaining walls that are part of the building (if any), should be based on at-rest pressure using the coefficient $K_O = 0.45$ as cited in the table below. Lateral soil loading on retaining walls apart from the building can be designed with active pressure using the coefficient $K_A = 0.28$ for level backfill. The ultimate sliding coefficient for concrete on crushed stone or controlled fill is 0.60.

5.2.1 Seismic lateral loading for retaining walls that are part of the building should be with a total lateral force (seismic plus static at-rest pressure) equal to $24H^2$ lb/ft located at $\frac{1}{2}H$ above the bottom. The above value is based on the Mononobe-Okabe solution for the case with level backfill, no wall friction and no hydrostatic pressure. This value excludes the inertia of the soil and wall mass. The requirements for the seismic analyses of earth retention structures as part of the building shall be determined from the Connecticut Building Code (IBC) or the ASCE-7.

5.3 The **Frost Protection Depth** is 3.5 feet below the finish grades in areas, which are exposed to weather.

5.4 Summary of Foundation Design Parameters for the Building:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable Bearing Pressure</td>
<td>4,000 psf</td>
</tr>
<tr>
<td>Soil Unit Weight (Backfill) *</td>
<td>125 pcf</td>
</tr>
<tr>
<td>Internal Friction Angle (Backfill) *</td>
<td>34°</td>
</tr>
<tr>
<td>At-Rest Pressure Coefficient, $K_O$</td>
<td>0.45</td>
</tr>
<tr>
<td>Active Pressure Coefficient, $K_A$ (level backfill)</td>
<td>0.28</td>
</tr>
<tr>
<td>Ultimate Sliding Coefficient, concrete on crushed stone over soil or rock</td>
<td>0.60</td>
</tr>
<tr>
<td>Seismic Site Soil Profile Classification</td>
<td>D</td>
</tr>
<tr>
<td>Mapped MCE Spectral Response Acceleration for one second period, $S_1$</td>
<td>0.064</td>
</tr>
<tr>
<td>Mapped MCE Spectral Response Acceleration for short period, $S_S$</td>
<td>0.180</td>
</tr>
<tr>
<td>Frost Protection Depth</td>
<td>3.5 feet</td>
</tr>
</tbody>
</table>

* Backfill material conforming to section 6.0 below
5.5 Footbridge across Wash Bridge (applicable borings - B-1 and B-11): The abutment at the library side of the brook should be placed on the moraine soil below the fill on 12" of crushed 3/8" stone atop a geotextile (Mirafi 500X or equal) with an allowable bearing pressure of 4000 psf. The abutment on the west side of the brook will be on looser material than on the east side. The footing should be below the silt about 6 feet below grade on 18" of crushed 3/8" stone on a geotextile. The stone and geotextile should be carried at least 18" outside the footing. The allowable bearing pressure on the 18" of crushed stone at the west abutment should be 3,000 psf. It is assumed that the bridge abutments would be sufficiently offset from the Brook that they would not be subject to scour.

5.5.1 Backfill of the abutments should conform to the gradation section 6.0 below.

6.0 Regarding Controlled Fill, Backfill for Retaining Walls and Excavations at Columns and Walls, plus Slab at Grade Underlayment (to 4" below the slab bottom) the material should conform to the following or be 3/8" crushed stone:

<table>
<thead>
<tr>
<th>Percent Passing</th>
<th>Sieve Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3.5&quot;</td>
</tr>
<tr>
<td>50 - 100</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>25 - 75</td>
<td>No.4</td>
</tr>
</tbody>
</table>

The fraction, passing the No.4 sieve should have less than 15%, passing the No. 200 sieve.

All backfill and fill must be compacted to at least 95% of modified optimum density.

6.1 With the Controlled/Structural Fill Option all topsoil, subsoil and existing fills and organic soils should be removed from beneath the floor slabs and replaced with controlled fill. The controlled fill should conform to section 6.0 above. The final 6" directly beneath the slab on grade floors should be with processed stone base. A vapor retarder is required under slabs at grade.

6.2 Slab on Grade Floors with aggregate pier support: There should be at least 18" of controlled fill beneath the floors placed to within 6" of the slab bottom. The final 6" directly beneath the slab should be with 3/8" crushed stone or 3/4" processed aggregate base. For the aggregate pier option the preparation beneath the 18" of controlled fill should be specified by the design-building foundation contractor. A vapor retarder is required under slabs on grade.

7.0 Regarding Earthwork, excavations in the natural soils will fall in OSHA Class C. This will require sloping of excavations, which are unshored and exceed 5 feet in height, to be cut back to slopes less than 34° from the horizontal (1.5H:1V).

7.1 The recommended pavement cross sections (bituminous concrete + base + subbase), unless superceded by Town of Bloomfield requirements, are as follows:
For main access drives: 4" of bituminous concrete (1.5" Class 2 over 2.5" Class 1) on 6" of processed stone base over 10" of gravel subbase

For parking areas; 3" of bituminous concrete on 6" of processed stone base over 10" of gravel subbase

For concrete pavements; (1) truck access; 7" concrete over 12" of processed stone base (2) for passenger vehicles; 5" of concrete on 12" processed stone base.

For pavers: sand bedding over 8" of processed stone base over gravel subbase

**8.0** This report has been prepared for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Welti Geotechnical, P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions, please call our office.

Very truly yours,

Max Welti, P.E.
President, Welti Geotechnical, P.C.

Clarence Welti Ph.D., P. E.
Vice President
APPENDIX

BORING LOCATION PLAN
+
TEST BORING LOGS
+
LABORATORY TEST RESULTS
NOTE: BORINGS B-3 & B-7 WERE NOT DRILLED DUE TO POSSIBLE CONFLICTS WITH UNMARKED UTILITIES.
### Ground Water Observations

**HOLE NO.** B-1  
**CLIENT** TOWN OF BLOOMFIELD  
**PROJECT NAME** PROPOSED NEW PROSSER LIBRARY  
**LOCATION** 6 MOUNTAIN AVENUE, BLOOMFIELD, CT  
**DRILLER** K. CHRISTIANA  
**INSPECTOR** S. SHEET 1 OF 1  
**HOLE NO.** B-1  
**TYPE** HSA  
**SIZE I.D.** 3.75"  
**HAMMER WT.** 140lbs  
**HAMMER FALL.** 30"  

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>SAMPLE NO.</th>
<th>BLOWS/6&quot;</th>
<th>DEPTH</th>
<th>STRATUM DESCRIPTION</th>
<th>REMARKS</th>
<th>ELEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>8-3-3-5</td>
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<td></td>
<td>0.33</td>
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<tr>
<td></td>
<td>2</td>
<td>4-5-5-6</td>
<td>3.0'-5.0'</td>
<td>BR.FINE-CRS.SAND AND GRAVEL, LITTLE SILT</td>
<td>LIGHT GREY/BR.FINE SAND, SOME SILT - FILL</td>
<td>0.66</td>
</tr>
<tr>
<td>5</td>
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<td>5.0'-7.0'</td>
<td>DARK GREY FINE SAND, SOME SILT</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4-6-5-4</td>
<td>7.0'-9.0'</td>
<td>BR.FINE-CRS.SAND, SOME SILT &amp; GRAVEL</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>7-8-8</td>
<td>10.0'-11.5'</td>
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<td></td>
<td>100</td>
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<td>15</td>
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<td>25-60</td>
<td>15.0'-16.0'</td>
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<td>95</td>
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<tr>
<td>20</td>
<td>7</td>
<td>20-30-40</td>
<td>20.0'-21.5'</td>
<td>BOTTOM OF BORING @ 21.5'</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85</td>
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**LEGEND: COL. A:**  
- AUGER: A  
- CASING: C  
- SAMPLER: S  
- CORE BAR. OFFSET: C  
- LIN & STA: L  
- N. COORDINATE: N  
- HOLE NO.: H  
- SURFACE ELEV.: S  
- GROUND WATER OBSERVATIONS: G  
- START DATE: D  
- FINISH DATE: F  

**SAMPLE TYPE:**  
- D=DRY  
- A=AUGER  
- C=CORE  
- U=UNDISTURBED PISTON  
- S=SPLIT SPOON  

**PROPORTIONS USED:**  
- TRACE=0-10%  
- LITTLE=10-20%  
- SOME=20-35%  
- AND=35-50%  

**ELEV.**:  
- 110  
- 105  
- 100  
- 95  
- 90  
- 85  
- 80  
- 21.5
## Ground Water Observations

**Location:** 6 Mountain Avenue, Bloomfield, CT

**Client:** Town of Bloomfield

**Project Name:** Proposed New Prosser Library

**Driller:** K. Christiana

**Inspector:** Sheet 1 of 1

<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample No.</th>
<th>Blows/6&quot;</th>
<th>Depth</th>
<th>Stratum Description + Remarks</th>
<th>Elev.</th>
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<tbody>
<tr>
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<td>6-8-8-9</td>
<td>3.0'-5.0'</td>
<td>BR.FINE-CRS.SAND AND GRAVEL, LITTLE SILT</td>
<td>0.66</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>6-3-4-4</td>
<td>5.0'-7.0'</td>
<td>Dark BR.FINE-MED.SAND, SOME SILT, LITTLE GRAVEL - FILL</td>
<td>3.5</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>6-8-11</td>
<td>10.0'-11.5'</td>
<td>Light Grey/BR.FINE SAND, TRACE SILT</td>
<td>5.5</td>
</tr>
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<td>15</td>
<td>5</td>
<td>32-60</td>
<td>15.0'-15.7'</td>
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<td>9.0</td>
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<td>20</td>
<td>6</td>
<td>13-60</td>
<td>20.0'-20.8'</td>
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<td>20.9</td>
</tr>
<tr>
<td>25</td>
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<td></td>
<td></td>
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<td>35</td>
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<td></td>
<td></td>
<td></td>
<td>80</td>
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</tbody>
</table>

**Legend:**
- **AUGER:** HSA
- **CASING:** SS
- **SAMPLER:** Core Bar.
- **OFFSET:** Line & Sta.
- **SIZE I.D.:** 3.75" 1.375"
- **HAMMER WT.:** 140 lbs
- **HAMMER FALL:** 30"
- **START DATE:** 2/16/22
- **FINISH DATE:** 2/16/22

**Sample Type:** D=DRY  A=AUGER  C=CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON

**Proportions Used:** Trace=0-10% Little=10-20% Some=20-35% And=35-50%
### Sample Type Legend

- **D** = DRY
- **A** = AUGER
- **C** = CORE
- **U** = UNDISTURBED PISTON
- **P** = SPLIT SPOON

### Sample Proportions

- **TRACE** = 0-10%
- **LITTLE** = 10-20%
- **SOME** = 20-35%
- **AND** = 35-50%

### Depth and Description

<table>
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<tr>
<th>Depth</th>
<th>Sample No.</th>
<th>Blows/6&quot;</th>
<th>Depth</th>
<th>Stratum Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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<td>6-7-11-5</td>
<td>1.0'-3.0'</td>
<td>ASPHALT</td>
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</tr>
<tr>
<td></td>
<td>2</td>
<td>2-1-1-1</td>
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<td></td>
</tr>
<tr>
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<td>3</td>
<td>0-0-1-1</td>
<td>5.0'-7.0'</td>
<td>DARK GREY SILT, LITTLE ORGANICS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3-3-2-3</td>
<td>7.0'-9.0'</td>
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<tr>
<td>15</td>
<td>6</td>
<td>3-2-8</td>
<td>15.0'-16.5'</td>
<td>BR.FINE-CRS.SAND, SOME SILT &amp; GRAVEL</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>7-10-19</td>
<td>20.0'-21.5'</td>
<td>BOTTOM OF BORING @ 21.5'</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Details

- **Client**: TOWN OF BLOOMFIELD
- **Project Name**: PROPOSED NEW PROSSER LIBRARY
- **Location**: 6 MOUNTAIN AVENUE, BLOOMFIELD, CT
- **Driller**: K. CHRISTIANA
- **Inspector**: S. SHEET
- **Sheet**: 1 of 1
- **Hole No.**: B-4
<table>
<thead>
<tr>
<th>DEPTH</th>
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<th>STRATUM DESCRIPTION + REMARKS</th>
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</tr>
<tr>
<td>5</td>
<td>3</td>
<td>DARK GREY SILT, LITTLE ORGANICS</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>DARK GREY/BR. SILT, TRACE CLAY &amp; FINE SAND</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>GREY/BR.VARVED SILT, LITTLE CLAY</td>
</tr>
<tr>
<td>15</td>
<td>6</td>
<td>BR.FINE-CRS.SAND AND SILT, SOME GRAVEL</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>BOTTOM OF BORING @ 21.5'</td>
</tr>
</tbody>
</table>

**LEGEND:**
- **AUGER:**
- **CASING:** SS
- **SAMPLE:** D=DRY  A=AUGER  C=CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON
- **CORE BAR:**
- **OFFSET:**
- **LINE & STA.:**
- **SURFACE ELEV.:** 113
- **HOLE NO.:** B-5
- **TYPE:** HSA
- **SIZE I.D.:** 3.75" 1.375"
- **HAMMER WT.:** 140lbs
- **HAMMER FALL:** 30"
<table>
<thead>
<tr>
<th>DEPTH</th>
<th>SAMPLE NO.</th>
<th>BLOWS/6&quot;</th>
<th>DEPTH</th>
<th>STRATUM DESCRIPTION + REMARKS</th>
<th>ELEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>3-4-4-4</td>
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<td>ASPHALT</td>
<td>0.25</td>
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<tr>
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<td>2</td>
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<td>0.50</td>
</tr>
<tr>
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<td>3</td>
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<td>DARK BR.FINE-MED.SAND, SOME SILT - FILL</td>
<td>2.5</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>3-2-2-2</td>
<td>7.0'-9.0'</td>
<td>BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL - FILL</td>
<td>4.0</td>
</tr>
<tr>
<td>10</td>
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<td>1-2-3-3</td>
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<td>DARK GREY SILT, TRACE FINE SAND &amp; CLAY</td>
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</tr>
<tr>
<td>15</td>
<td>6</td>
<td>8-12-16</td>
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<td>10.0</td>
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<tr>
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<td>7</td>
<td>12-18-23</td>
<td>20.0'-21.5'</td>
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<td>8</td>
<td>60</td>
<td>25.0'-25.4'</td>
<td>BR.FINE-CRS.SAND AND SILT, SOME GRAVEL</td>
<td>29.0</td>
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<td></td>
<td></td>
<td>BOTTOM OF BORING @ 29.0' (AUGER REFUSAL)</td>
<td>80.0</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85.0</td>
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</tbody>
</table>

LEGEND: COL. A:
SAMPLE TYPE: D=DRY  A=AUGER  C=CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR: CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT: TOWN OF BLOOMFIELD
PROJECT NAME: PROPOSED NEW PROSSER LIBRARY
LOCATION: 6 MOUNTAIN AVENUE, BLOOMFIELD, CT

TOWN OF BLOOMFIELD
PROJECT NAME: PROPOSED NEW PROSSER LIBRARY
LOCATION: 6 MOUNTAIN AVENUE, BLOOMFIELD, CT

AUGER CASING SAMPLER CORE BAR. OFFSET SURFACE ELEV. HOLE NO. B-6
<table>
<thead>
<tr>
<th>TYPE</th>
<th>HSA</th>
<th>SS</th>
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</table>
| SIZE I.D. | 3.75" | 1.375"
<p>| HAMMER WT. | 140lbs |
| HAMMER FALL | 30&quot; |</p>
<table>
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<tr>
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<th>DEPTH</th>
<th>STRATUM DESCRIPTION</th>
<th>REMARKS</th>
<th>ELEV.</th>
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<tbody>
<tr>
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<td>1</td>
<td>7-5-3-3</td>
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<td>2</td>
<td>4-4-3-4</td>
<td>3.0'-5.0'</td>
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<td></td>
<td>0.50</td>
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<tr>
<td>5</td>
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<td>5.0'-7.0'</td>
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<td>115</td>
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<td>110</td>
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<td>9.0'-11.0'</td>
<td>BR.FINE-MED.SAND, TRACE SILT</td>
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<td>9.5</td>
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<td></td>
<td>BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL</td>
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<td>13.0</td>
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<td>8-9-18</td>
<td>15.0'-16.5'</td>
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<td>105</td>
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<td>7</td>
<td>60</td>
<td>20.0'-20.3'</td>
<td>BOTTOM OF BORING @ 20.3'</td>
<td></td>
<td>20.3</td>
</tr>
<tr>
<td>25</td>
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**LEGEND: COL. A:**
- D=DRY  A=AUGER  C= CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON
- TRACE=0-10%  LITTLE=10-20%  SOME=20-35%  AND=35-50%

**DRILLER:** K. CHRISTIANA  
**INSPECTOR:**  
**SHEET 1 OF 1  HOE NO. B-8**
<table>
<thead>
<tr>
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<td>0</td>
<td>1</td>
<td>2-1-1-1</td>
<td>1.0'-3.0'</td>
<td>ASPHALT</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1-0-0-1</td>
<td>3.0'-5.0'</td>
<td>BR.FINE-CRS.SAND AND GRAVEL, LITTLE SILT - FILL</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2-3-4-7</td>
<td>5.0'-7.0'</td>
<td>DARK BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL - FILL</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>3-3-4-5</td>
<td>7.0'-9.0'</td>
<td>GREY/BR.FINE SAND, TRACE TO LITTLE SILT</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>7-60</td>
<td>9.0'-9.7'</td>
<td>BR.FINE-CRS.SAND, LITTLE SILT</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>6-15</td>
<td>15.0'-16.5'</td>
<td>GREY/BR.SILT, LITTLE CLAY</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>7-25</td>
<td>20.0'-21.0'</td>
<td>BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL, FEW COBBLES</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td></td>
<td></td>
<td>BOTTOM OF BORING @ 21.0'</td>
<td>21.0</td>
</tr>
</tbody>
</table>

LEGEND: COL A:
SAMPLE TYPE: D=DRY  A=AUGER  C=CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:
<table>
<thead>
<tr>
<th>DEPTH NO.</th>
<th>SAMPLE BLOW/6&quot;</th>
<th>DEPTH</th>
<th>STRATUM DESCRIPTION + REMARKS</th>
<th>ELEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 7-6-3-4</td>
<td>1.0'-3.0'</td>
<td>ASPHALT, DARK GREY/B.R.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL, TRACE CONCRETE - FILL</td>
<td>115</td>
</tr>
<tr>
<td>0</td>
<td>2 60</td>
<td>3.0'-3.2'</td>
<td></td>
<td>110</td>
</tr>
<tr>
<td>0</td>
<td>3 2-2-12-14</td>
<td>4.0'-6.0'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4 5-2-2-7</td>
<td>6.0'-8.0'</td>
<td>LIGHT GREY FINE SAND, TRACE TO LITTLE SILT</td>
<td>9.0</td>
</tr>
<tr>
<td>10</td>
<td>5 5-7-8-11</td>
<td>8.0'-10.0'</td>
<td>BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL, FEW COBBLES</td>
<td>13.0</td>
</tr>
<tr>
<td>15</td>
<td>6 2-5-2-4</td>
<td>10.0'-12.0'</td>
<td>BOTTOM OF BORING @ 21.5'</td>
<td>21.5</td>
</tr>
<tr>
<td>20</td>
<td>7 14-20-25</td>
<td>15.0'-16.5'</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>25</td>
<td>8 15-25-20</td>
<td>20.0'-21.5'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LEGEND: COL. A:
SAMPLE TYPE: D=DRY  A=AUGER  C=CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%
<table>
<thead>
<tr>
<th>Depth</th>
<th>Sample No.</th>
<th>Bows/6”</th>
<th>Depth</th>
<th>Stratum Description + Remarks</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>6-4-3-3</td>
<td>1.0’-3.0’</td>
<td>ASPHALT</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2-2-2-2</td>
<td>3.0’-5.0’</td>
<td>BR.FINE-CRS.SAND, LITTLE SILT &amp; GRAVEL - FILL</td>
<td>0.75</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>2-1-3-3</td>
<td>5.0’-7.0’</td>
<td>DARK BR.SILT, TRACE FINE SAND</td>
<td>110</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>2-3-2-2</td>
<td>7.0’-9.0’</td>
<td>GREY FINE-MED.SAND, LITTLE SILT</td>
<td>105</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>2-2-3</td>
<td>10.0’-11.5’</td>
<td>GREY/BR.VARVED SILT, LITTLE CLAY</td>
<td>100</td>
</tr>
<tr>
<td>15</td>
<td>6</td>
<td>3-4-4</td>
<td>15.0’-16.5’</td>
<td>BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL</td>
<td>95</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>12-6-0</td>
<td>20.0’-20.9’</td>
<td>BOTTOM OF BORING @ 21.0’ (AUGER REFUSAL)</td>
<td>90</td>
</tr>
</tbody>
</table>

LEGEND: COL. A:
SAMPLE TYPE: D=DRY  A=AUGER  C=CORE  U=UNDISTURBED PISTON  S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10%  LITTLE=10-20%  SOME=20-35%  AND=35-50%

DRILLER: K. CHRISTIANA
INSPECTOR:

CLIENT: TOWN OF BLOOMFIELD
PROJECT NAME: PROPOSED NEW PROSSER LIBRARY
LOCATION: 6 MOUNTAIN AVENUE, BLOOMFIELD, CT

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033
Particle Size Distribution Report

CLARENCE WELTI ASSOCIATES, INC.

---

<table>
<thead>
<tr>
<th>Material Description</th>
<th>USCS</th>
<th>AASHTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Sample: B-2</td>
<td>Depth: 5.5</td>
<td></td>
</tr>
<tr>
<td>Source of Sample: B-4</td>
<td>Depth: 6.0</td>
<td></td>
</tr>
<tr>
<td>Source of Sample: B-5</td>
<td>Depth: 1.0</td>
<td>Sample Number: 1</td>
</tr>
</tbody>
</table>

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Table:

<table>
<thead>
<tr>
<th>% +3”</th>
<th>% Gravel</th>
<th>% Sand</th>
<th>% Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coarse</td>
<td>Fine</td>
<td>Medium</td>
</tr>
<tr>
<td>⬤</td>
<td>15.5</td>
<td>21.6</td>
<td>19.7</td>
</tr>
<tr>
<td>▲</td>
<td>15.4</td>
<td>6.8</td>
<td>17.7</td>
</tr>
</tbody>
</table>

---

Graph:

- **PERCENT FINER**
- **PERCENT COARSER**
- **GRAIN SIZE - mm.**

### Remarks:

- Water content = 29.0%
- Water content = 24.7%
- Water content = 7.1%

---

Project No. Client: TOWN OF BLOOMFIELD
Project: PROPOSED NEW PROSSER LIBRARY

---

Figure
Particle Size Distribution Report

<table>
<thead>
<tr>
<th>% +3”</th>
<th>% Gravel</th>
<th>% Sand</th>
<th>% Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse</td>
<td>Fine</td>
<td>Coarse</td>
<td>Medium</td>
</tr>
<tr>
<td>○</td>
<td>4.9</td>
<td>27.6</td>
<td>45.7</td>
</tr>
<tr>
<td>□</td>
<td>10.4</td>
<td>18.1</td>
<td>23.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LL</th>
<th>PL</th>
<th>D_85</th>
<th>D_60</th>
<th>D_50</th>
<th>D_30</th>
<th>D_15</th>
<th>D_10</th>
<th>C_U</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>16.9267</td>
<td>4.4910</td>
<td>1.9302</td>
<td>0.3709</td>
<td>0.1515</td>
<td>0.0913</td>
<td>0.34</td>
<td>49.20</td>
</tr>
<tr>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Material Description

USCS

AASHTO

---

Project No. | Client: TOWN OF BLOOMFIELD
---

Project: | PROPOSED NEW PROSSER LIBRARY
---

Source of Sample: B-6 | Depth: 8.0

Source of Sample: B-8 | Depth: 3.0 | Sample Number: 2

Remarks:

- ○ water content = 29.6%
- □ water content = 23.7%

CLARENCE WELTI ASSOCIATES, INC.
1. EXECUTIVE SUMMARY

The Town of Bloomfield, CT is planning major renovations at the municipal Prosser and McMahon libraries, and is seeking LEED certification for the two projects. Currently the team is going through the schematic design phase and is considering several HVAC system types that are being compared in this preliminary energy model.

The systems under consideration are:

- Packaged Rooftop VAV with hot water heat and DX cooling
- Air-cooled VRF plus DOAS with gas heat, DX cooling, and heat recovery
- Packaged Rooftop VAV with hot water heat and chilled water cooling

Since the design parameters of each system have not been decided yet, the preliminary energy model makes numerous assumptions based on minimum expected efficiencies for each type of equipment. This SD phase model also makes some simplifying assumptions about building geometry and zoning, among other inputs.

The following chart summarizes the annual energy cost estimates for each system in Prosser Library:

<table>
<thead>
<tr>
<th>System</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAV HW DX</td>
<td>$58,996</td>
</tr>
<tr>
<td>VRF</td>
<td>$49,364</td>
</tr>
<tr>
<td>VAV WH CHW</td>
<td>$63,358</td>
</tr>
</tbody>
</table>

This second chart shows the annual energy cost estimates for McMahon Library:

<table>
<thead>
<tr>
<th>System</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAV HW DX</td>
<td>$22,585</td>
</tr>
<tr>
<td>VRF</td>
<td>$18,848</td>
</tr>
<tr>
<td>VAV WH CHW</td>
<td>$24,487</td>
</tr>
</tbody>
</table>

The conclusion drawn from these preliminary models is that the VRF system will give us the best chance of obtaining higher LEED points for the building projects.

RZ Design can provide additional detail about the systems in question. Although the VRF is the best choice from a LEED energy model perspective, there may be other factors the team and owner wish to take into consideration.

SHG is available for further discussion as the design develops and the team seeks to maximize LEED points for this credit.
2. ASSUMPTIONS AND TALKING POINTS

Hours of operation for the buildings were determined by looking at the library website. Default values were taken for daily occupancy; these can be changed if the team has more specific information to provide later.

During the LEED kickoff charette, it was discussed that the buildings are getting new windows and a new roof, but that there might not be any improvements to the walls. Existing wall drawings appear to show a 2” layer of continuous insulation inside the face brick masonry, giving the walls an approximate U-value of 0.08. A roof value of R-30 and a window value of U-0.36 were assumed for the new modifications.

For comparison purposes, it doesn’t matter as much what these values are, since they are equal in all three scenarios. However, they will have to be confirmed for the final model. LEED energy modeling rules do not allow us to use the existing envelope as a baseline for comparison in an existing building. The baseline comparison assumes that the envelope would be brought up to code during renovations.

LEED relies on energy cost – not energy consumption – as a metric for comparison. The latest rules continue to do so, but add an additional component for greenhouse gas reduction. The energy model points are split evenly between cost and greenhouse gas improvements.

The team may be able to take GHG reduction credit for energy model points if they pursue green power/GHG offset credits elsewhere in LEED.

The team may also be able to take credit for power produced by an on-site solar array if that is pursued for either building.

We recommend that the design team take aggressive steps to pursue energy efficiency beyond the minimums for whatever system type is chosen. The newest LEED rules use ASHRAE 90.1-2016 as a baseline for comparison, which is stricter than current Connecticut energy code, and the LEED energy model points system has been changed to require considerable savings above even this relatively strict standard.

Although it was relatively easy in previous versions of LEED to get a large number of points from the energy model with minimal effort, with the much stricter rules now in place, the Library projects may only get a couple points unless a determined effort is made to reduce energy.

The energy cost budget report is a typical energy model output provided for reference in the appendix. The LEED points earned by the model are determined by inputting these energy costs and consumptions into a formula found in the LEED reference book.
3. UNDER THE HOOD

THE STONE HOUSE GROUP utilizes Trane TRACE energy modeling software. This model was produced using version 6.3.5. Modeling a building in TRACE is non-graphic based, and proceeds through phases by defining the building spaces, adding exterior exposure and envelope details, defining mechanical systems, zoning spaces, defining heating and cooling generation plants, and inputting utility rate information. Weather for the simulation is based on historical averages recorded at the nearest available weather station in the appropriate climate zone, in this case Hartford Bradley Airport.

LIMITATIONS

It is important to note that energy modeling is not a crystal ball which can predict actual energy use or cost for a building. Real life operation of the building and actual weather conditions may vary considerably; therefore, we do not advise using the numbers generated by this analysis as an expectation of exactly how much energy the building will consume. Rather, the purpose is to show the relative amount of energy cost/consumption several different system types will experience, given operating and environmental parameters that are held equal.

APPENDIX

Preliminary Energy Cost Budget Report
# Energy Cost Budget / PRM Summary

By SHG

**Project Name:** Bloomfield Prosser Library  
**City:** Bloomfield, CT

---

**Alt-4 2016 APP G BASELINE**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Proposed / Base %</th>
<th>Peak kBtuh</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>390.1</td>
<td>20</td>
<td>126</td>
<td>61,529</td>
</tr>
<tr>
<td>Gas</td>
<td>660.3</td>
<td>34</td>
<td>658</td>
<td>7,388</td>
</tr>
<tr>
<td>Total Building Consumption</td>
<td>1,917.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Time:**

- **Total Number of hours heating load not met:** 0
- **Total Number of hours cooling load not met:** 0

**Electricity**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>1,256.7</td>
<td>61,529</td>
</tr>
<tr>
<td>Gas</td>
<td>660.3</td>
<td>7,388</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,917.0</td>
<td>68,917</td>
</tr>
</tbody>
</table>

---

**Alt-1 Proposed VAV**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Proposed / Base %</th>
<th>Peak kBtuh</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>268.4</td>
<td>69</td>
<td>87</td>
<td>53,594</td>
</tr>
<tr>
<td>Gas</td>
<td>482.8</td>
<td>73</td>
<td>632</td>
<td>5,402</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,577.4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Electricity**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>1,094.6</td>
<td>53,594</td>
</tr>
<tr>
<td>Gas</td>
<td>482.8</td>
<td>5,402</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,577.0</td>
<td>58,996</td>
</tr>
</tbody>
</table>

---

**Alt-2 Proposed VRF**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Proposed / Base %</th>
<th>Peak kBtuh</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>268.4</td>
<td>69</td>
<td>87</td>
<td>48,587</td>
</tr>
<tr>
<td>Gas</td>
<td>69.4</td>
<td>11</td>
<td>98</td>
<td>777</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,062</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Electricity**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>992.4</td>
<td>48,587</td>
</tr>
<tr>
<td>Gas</td>
<td>69.4</td>
<td>777</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,062</td>
<td>49,364</td>
</tr>
</tbody>
</table>

---

**Alt-3 Proposed CHW**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Proposed / Base %</th>
<th>Peak kBtuh</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>268.4</td>
<td>69</td>
<td>87</td>
<td>57,920</td>
</tr>
<tr>
<td>Gas</td>
<td>486.0</td>
<td>74</td>
<td>632</td>
<td>5,438</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,669</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Electricity**

<table>
<thead>
<tr>
<th>Energy 10^6 Btu/yr</th>
<th>Cost/yr</th>
<th>$/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>1,183.0</td>
<td>57,920</td>
</tr>
<tr>
<td>Gas</td>
<td>486.0</td>
<td>5,438</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,669</td>
<td>63,358</td>
</tr>
</tbody>
</table>

---

**Note:** The percentage displayed for the "Proposed / Base %" column of the base case is actually the percentage of the total energy consumption.  
* Denotes the base alternative for the ECB study.

---

**Weather Data:** Hartford, Connecticut 8760

**Date:** March 11, 2022

---

**TRACE® 700 v6.3.5 calculated at 08:38 AM on 03/11/2022**
## Energy Cost Budget / PRM Summary

By SHG

<table>
<thead>
<tr>
<th>Project Name: Bloomfield McMahon Library</th>
<th>Date: March 10, 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>City: Bloomfield, CT</td>
<td>Weather Data: Hartford, Connecticut 8760</td>
</tr>
</tbody>
</table>

Note: The percentage displayed for the "Proposed/ Base %" column of the base case is actually the percentage of the total energy consumption.

* Denotes the base alternative for the ECB study.

<table>
<thead>
<tr>
<th>Energy Cost Budget / PRM Summary</th>
<th>* Alt-4 2016 App G Baseline</th>
<th>Alt-1 Proposed VAV</th>
<th>Alt-2 Proposed VRF</th>
<th>Alt-3 Proposed CHW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base</strong></td>
<td>Energy 10^6 Btu/yr</td>
<td>Proposed / Base %</td>
<td>Peak kBtuh</td>
<td>Energy 10^6 Btu/yr</td>
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<td>37</td>
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<td>Space Heating</td>
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<td>21.9</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Gas</td>
<td>216.2</td>
<td>31</td>
<td>216</td>
</tr>
<tr>
<td>Space Cooling</td>
<td>Electricity</td>
<td>62.1</td>
<td>9</td>
<td>101</td>
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<tr>
<td>Pumps</td>
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<td>Heat Rejection</td>
<td>Electricity</td>
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<td>1</td>
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<tr>
<td>Fans - Conditioned</td>
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<tr>
<td>Receptacles - Conditioned</td>
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<tr>
<td>Stand-alone Base Utilities</td>
<td>Electricity</td>
<td>19.2</td>
<td>3</td>
<td>4</td>
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<tr>
<td><strong>Total Building Consumption</strong></td>
<td></td>
<td>686.8</td>
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<table>
<thead>
<tr>
<th>Energy Cost Budget / PRM Summary</th>
<th>* Alt-4 2016 App G Baseline</th>
<th>Alt-1 Proposed VAV</th>
<th>Alt-2 Proposed VRF</th>
<th>Alt-3 Proposed CHW</th>
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</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>Number of hours heating load not met</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td>Number of hours cooling load not met</td>
<td>10</td>
<td>174</td>
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<tr>
<th>Energy Cost Budget / PRM Summary</th>
<th>* Alt-4 2016 App G Baseline</th>
<th>Alt-1 Proposed VAV</th>
<th>Alt-2 Proposed VRF</th>
<th>Alt-3 Proposed CHW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity</strong></td>
<td>Energy 10^6 Btu/yr</td>
<td>Cost/yr $/yr</td>
<td>Energy 10^6 Btu/yr</td>
<td>Cost/yr $/yr</td>
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<td>470.6</td>
<td>23,040</td>
<td>408.8</td>
<td>20,016</td>
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<td><strong>Gas</strong></td>
<td>216.2</td>
<td>2,419</td>
<td>229.6</td>
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<td><strong>Total</strong></td>
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<td>25,459</td>
<td>638</td>
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