Town of Ellington

The Expansion and Renovate as New for the Crystal Lake Elementary School

Schematic Report

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Final Report:

Ellington Public Building Commission

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I. PROGRAM INFORMATION

In the fall of 2012 the Town of Ellington hired Silver/Petrucelli + Associates to design the renovation and expansion of the existing Crystal Lake Elementary School, located at Sandy Beach Road in Ellington. A feasibility report was prepared by Moser Pilon Nelson Architects dated November 10, 2011. The proposed renovations and additions will yield grades K through 6. The entire project is seeking a "renovate-as-new" status which is offered by the State Department of Education under State Statute 10-282.

During the Schematic Design Phase of the project, the proposed program space layout was revised and again "tested" where the Architects, the Building Committee, and Administrators collaborated and confirmed the validity of each space, its size and the specific needs. Each of the program spaces have been discussed in detail, augmenting the space summaries with some furniture and fixture layouts, equipment and use information that gave better definition to the program spaces that are expected in the elementary school. One of the main goals of the educators is to satisfy the educational program requirements in the most cost effective manner possible. The architects/engineers and committee also considered alternative site layouts that would help to reduce the overall construction costs.

On December 11, 2012 the building committee unanimously approved the floor and exterior design layouts and concepts. This schematic report represents the design intent and conceptual ideas expressed throughout the design process by the design team, administrators, educators and building committee. The design team will begin to progress further into design process with a next milestone being Design Development. The sections detailed below are to provide a conceptual understanding of the overall project. The report does not address the construction activities or timeline in detail but, preliminary discussion with the construction manager consisted of a multiple phased construction sequencing. The building will remain operational during construction resulting in creative solutions to scheduling and safety. These details will be discussed by the project team as the project progresses.

II. SYSTEM NARRATIVES

A. SITE CONDITIONS AND UTILITY SYSTEMS

This site consists of property located at 284 Sandy Beach Road in Ellington, Connecticut. The site is bordered by South Road and one (1) residential property to the west, Sandy Beach Road (CT Route 140) to the north, and several residential properties to the east and south. The site is approximately 16.2 acres, and includes an approximately 32,000 square foot, one-story, brick building, two (2) small wood sheds and an on-site well pump station.

DRAINAGE

Existing Conditions:

- The developed portion of the site is situated on the northeastern portion of the property, which is the high point of the site. The topography slopes from the approximate high point (El 686±) down towards South Road (El 656±). The south side of the site consists of an undeveloped, lightly wooded area, which slopes from the high point along the southern border (El 696±) northwards to a finger of wetlands, which runs west-east through the site (El 676±).
- Since there are no drainage facilities in Sandy Beach Road, a vast majority of the site is drained west to the drainage facilities located in South Road.
- The bituminous areas situated north and east of the building are accommodated by catch basins, which collect the storm runoff and route it through underground drainage piping, which discharge at several locations upland of South Road. From these discharge locations, storm runoff sheet flows west towards the drainage facilities in South Road.
- Roof flow is collected via series of building downspouts and transported through underground pipes that connect to the previously mentioned underground storm system.
- Storm-water runoff on the wooded, southern portion of the site sheet flows to the north into the wetlands system, where it then flows west towards the South Road drainage facilities.

Proposed Improvements:

The proposed design will meet Town and State requirements for peak flow mitigation, storm-water conveyance and water quality treatment. Proposed improvements include the following:

- Runoff from the building footprint and surrounding developed areas will be collected in a series of drainage structures and conveyed, via underground piping, to a proposed detention basin located on the western portion of the site, adjacent South Road. The detention basin will be equipped with an outlet control structure that is hard-piped into the existing South Street drainage facilities. The detention basin will be designed to mitigate peak flow up to the 100-year design storm, as required by the Town.
- The underground pipe system will be designed to convey the 10-year design storm, as required by the Town.
- The intent of the field design will be to incorporate under-drainage systems including stone storage and under-drain pipes, with the intent of removing surface water as quickly as possible to maximize playability.

- The site will be designed to treat storm-water runoff for water quality in accordance with the Connecticut Department of Energy & Environmental Protection (CT DEEP) 2004 Storm-water Quality Manual.

DOMESTIC WATER AND FIRE PROTECTION

Existing Conditions:

Domestic water is supplied to the building by two (2) on-site water wells located in the open field south of the building. Water is conveyed from the wells to an on-site pump station located on the east side of the site. From the pump station, water is provided to the school via several small (1" and 2") pipes. The existing system was installed within the past five (5) years.

Currently there is no fire protection provided to the building.

Proposed Improvements:

The existing domestic system will be maintained.

Fire protection will be provided to the building via a new underground fire protection storage tank, located within the proposed courtyard. See the Mechanical Section for a detailed description.

SEWER

Existing Conditions:

Currently an on-site, underground septic system provides sewer services to the facility. The leaching field is located under the lawn area southwest of the building.

Proposed Improvements:

The existing septic system will be removed and replaced with a gravity sanitary system that connects to the existing gravity main in Sandy Beach Road. A grease trap will be provided outside the kitchen to remove grease before the flow connects to the public sanitary sewer.

ELECTRIC AND TELECOMMUNICATIONS

Existing Conditions:

Electricity is provided to the site by Connecticut Light & Power (CL&P) from a pole along Sandy Brook Road. The primary feed transitions from overhead wiring at SNET Pole #2008 adjacent the Sandy Brook Road entrance to an underground conduit which feeds the transformer, located at the northeast corner of the facility.

Telecommunications are provided from the same utility pole as the primary electric. The telecommunications wiring, however, continues overhead to the facility.

Proposed Improvements:

The underground primary electric from SNET Pole #2008 to the transformer, as well as the transformer itself, will be replaced.

The overhead telecommunications will be replaced with underground conduits and wiring from SNET Pole #2008 to the facility.

ACCESSIBILITY

Existing Conditions:

The main entrance to the school, located on the north side of the building is handicap accessible. The current parking configuration does not provide the proper number of accessible parking spaces, as required by the Connecticut Building Code.

Proposed Improvements:

The project proposes to provide an accessible entrance at both main entrances; the parent drop area on the north side of the building and the bus drop entrance on the west side of the building. All other exterior doors will be at grade and accessible. The design will also provide the proper number of accessible parking spaces and a passenger loading zone, as required by the Connecticut Building Code.

Additionally, an accessible path will be provided from the school to the site amenities, such as the playgrounds and play fields.

CIRCULATION

Existing Conditions:

The site currently utilizes three (3) curb cuts on Sandy Beach Road, two (2) of which are part of a small parking lot owned by the church located across the street. The third curb cut is located just east of the church-owned parking lot. These curb cuts are unsafe for cars that exit onto Sandy Beach Road because of the limited sight line distances looking west on Sandy Beach Road. The parking/drop-off configuration does not provide a proper curb drop-off scenario for the five busses currently utilized by the school.

Proposed Improvements:

The project proposes to remove the use of both curb cuts and the parking lot currently owned by the church. Circulation for parent drop off and bus drop off will be separated. The parent drop off will be on the north side of the school and will be accessed by the existing curb cut on Sandy Beach Road. This connection will become entrance only. The entrance will have two (2) lanes; parent drop (left lane) will circulate to the curb adjacent the school north entrance and general visitor/handicap parking (right lane) will access the small parking lot north of the building.

A new curb cut on South Road will be utilized for busses and staff. As the entrance drive approaches the building it will separate into a dedicated bus lane and to two (2) parking areas. The bus lane will accommodate eight (8) full size busses.

Passenger loading zones will be provided at both drop-off areas, per the Connecticut Building Code.

All vehicles will exit the site from the South Road connection.

GENERAL PARKING

Existing Conditions:

Parking is provided at three locations on the site:

1. Church parking lot – this area is currently striped for 17 spaces.
2. Parking lot on north side of building – this area currently accommodates 37 spaces.
3. Overflow Parking – the bituminous play area located to the east of the building is currently utilized as event parking and accommodates approximately 32 spaces

Proposed Improvements:

The existing use of the church parking lot for school parking will be discontinued. Proposed parking will be provided at the following locations:

1. North Parking Area – approximately 15 spaces will be provided in this area. The church-owned lot adjacent the site will be physically separated from this parking area. The north parking area will be designated for visitor and handicap parking.
2. West Parking Area – west of the building and dedicated bus lane will be a parking area consisting of approximately 117 spaces. This will be designated for staff parking.
3. Overflow Parking – the area located to the east of the building will be utilized as event parking and will accommodate approximately 38 spaces.
4. School Field Parking – a small bituminous parking area located east of the proposed school field will accommodate approximately 22 spaces.
5. South Field Parking – a gravel parking area adjacent the south fields is proposed as 90° nose in parking to accommodate 16 spaces off the South Street entrance.

SITE AMENITIES

Existing Conditions:

Play Fields – the site contains a gently sloping lawn area south of the school that is utilized as general lawn play area. It does not appear that this area is defined as a specific sports field or that is has been constructed with under-drainage.

Play Areas – the site contains two (2) play sets of playground equipment, a swing set, and a bituminous play area with a basketball hoop.

Proposed Improvements:

Play Fields – the project proposes fields for both school use and town use. The school field is proposed to be designed as an age-appropriate U-10 size soccer field that will be located just south of the school. It should be noted that this field will be placed over one of the exposed water wells. It is assumed that the Connecticut Department of Public Health (CT DPH) will allow for modifications to the well, including a buried concrete vault (to allow surface access), so that the well may be covered. If CT DPH will not

allow the well to be buried, a smaller field will need to be utilized and it will be placed in a north-south orientation.

The town fields are proposed to be located on the south side of the site in the currently wooded area and will consist of overlapping high school regulation soccer and baseball fields. The high school regulation soccer field could also be utilized as two (2) U-10 fields. These fields will be accessed from the building, as well as the dedicated gravel parking area.

As currently designed, the U-10 soccer field adjacent the building, the high school regulation soccer field, and the high school regulation baseball field are situated in the optimum solar orientation. All fields will be provided proper under-drainage and will be handicap accessible.

Play Areas – the project proposed two (2) play areas; one (1) that is age appropriate for the 2-5 age group and one (1) that is age appropriate for the 5-12 age group. The play areas will be located directly south of the building.

Site Walls – the project proposes an approximately 80' long, three (3) foot high, modular block retaining wall at the northeast corner of the proposed high-school regulation soccer field. The wall will be necessary to prevent encroachment of fill into the wetlands.

Storage Buildings – the project proposes two (2) storage buildings for storage of maintenance equipment.

Loading Area – a loading area is proposed on the west side of the building, located just outside the kitchen. At the back of the loading area a dumpster pad will be provided. The loading area will be screened by plantings and/or screened fencing.

B. ARCHITECTURAL RENOVATIONS AND ADDITIONS

1. EXISTING EXTERIOR IMPROVEMENTS AND RENOVATIONS

All existing exterior doors and hardware will be replaced with new aluminum doors and frames and accessible hardware as well. All remaining existing single-pane, frame windows are being removed and replaced with new operable double-pane insulated energy efficient windows as part of the renovation. The glazing will be high reflective to limit the transmission of Ultra-Violet light. Many of the older windows will also be replaced.

The existing brick façade will need some limited repointing in areas, and the concrete foundation will require some minimal repair due to cracking. All the existing roofs will be replaced with high reflective single ply 20-year none pro-rated warranty system. Additional roof drains will be added to achieve a minimum roof slope of one-half inch per one foot slope. New perimeter edge metal will be installed around the existing portions of the building.

2. EXISTING INTERIOR IMPROVEMENTS AND RENOVATIONS

The interior improvements and renovations include items such as a full upgrade to all accessible related spaces. All doors, door frames and door hardware will be replaced with lever handled lockset, closers and panic bars, if applicable. All door hardware will be keyed to the Board of Education's master key system. Card-Controlled Access will be contemplated on certain doors.

All of the existing restrooms will be fully renovated with new finishes and fixtures and the restrooms will be designed to meet all ADA accessibility requirements. Handicapped accessible water coolers will also be installed on each floor/level. All windows will receive new translucent manually operated shades. The gymnasium will consist of bleachers, padded wall protection around the perimeter, sports flooring system with line stripping, school logo at center court, and retractable ceiling hung basketball equipment.

All of the classroom millwork, cabinetry and countertops are in poor condition and will be replaced with new upper and lower wooden cabinetry. The countertops will consist of cast plastic resin tops with different heights for accessibility. Each classroom will be outfitted with smart boards (part of FF&E) and white and tack boards. Enclosed cabinetry for coats and personal belongings will be implemented in each classroom. The media center will consist of age appropriate book shelves, a custom wooden circulation desk. All other equipment and furniture will be specified as part of the Furniture, Fixture and Equipment package (FF&E)

The existing floors throughout the corridors and classrooms will be removed and replaced with new sheet flooring (ex. Forbo Marmoleum) as part of the renovation of the existing school.

General Finish Schedule:

- Classrooms:
  - Flooring: Two colors sheet flooring with Rubber Base (ex. Forbo Marmoleum™)
  - Walls: Prime/Painted CMU One Wall Accent Color Wall
  - Ceilings: 2x2 15/16" grid with Fine Fissured High Reflectivity (ex. Armstrong School Zone™)
  - Window Treatment: Opaque Sun Shades (ex. MechaShade™)
  - 4'x12' tack/white boards (2)per classroom
- Art Classrooms
  - Flooring: Two colors sheet flooring with Rubber Base (ex. Forbo Marmoleum™)
  - Walls: Prime/Painted CMU
  - Ceilings: 2x2 15/16" grid with Fine Fissured High Reflectivity (ex. Armstrong School Zone™)
  - Window Treatment: Opaque Sun Shades (ex. MechaShade™)
  - (1) 4'x12' tack/white boards
- Music Room
  - Flooring: Carpet Tile (ex. Lees Greenworks)
  - Walls: Prime/Painted CMU
    - Acoustical Wall Panels
  - Ceilings: 2x2 15/16" grid with Fine Fissured High Reflectivity (ex. Armstrong School Zone™)
  - Window Treatment: Opaque Sun Shades (ex. MechaShade™)
  - (1) 4'x12' tack/white boards
- Restrooms
  - Flooring: Porcelain/Ceramic Tile 8x8 (2 colors)
  - Walls: Prime/Painted CMU
    4x4 glazed ceramic tile (2colors) mosaic pattern
  - Ceilings: 2x2 15/16" grid with Fine Fissured High Reflectivity (ex. Armstrong School Zone™)
  - Toilet Partitions: Solid Phenolic Partitions
- Media Center:
  - Flooring: Carpet Tile (ex. Lees Greenworks) custom pattern/shapes at reading area.
  - Walls: Prime/Painted CMU
    - Acoustical Wall Panels
  - Ceilings: 2x2 15/16" grid with Fine Fissured High Reflectivity (ex. Armstrong School Zone™)
    - Exposed decking at the high volume.
  - Window Treatment: Opaque Sun Shades (ex. MechaShade™) electronic (high volume)

- Offices and small classrooms:
  - Flooring: Carpet Tile (ex. Lees Greenworks) custom pattern/shapes
  - Walls: Prime/Painted CMU and/or gypsum Board
  - Ceilings: 2x2 15/16" grid with Fine Fissured High Reflectivity (ex. Armstrong School Zone™)
    - Exposed decking at the high volume.
  - Window Treatment: Opaque Sun Shades (ex. MechaShade™) electronic (high volume)

- Gymnasium:
    - Flooring: Composite sports floor
    - Walls: Prime/Painted CMU
        - Protective Wall Pads 8' high. (cut around doors and outlets)
    - Ceilings: Exposed decking and structure. Acoustical Sound Attenuation Panels placed throughout

The kitchen will be renovated to bring it up to current health and building code requirements, by adding a three-part compartment sink, fire suppression system for the hood, exterior grease trap, and 125 degree water to kitchen fixtures, among other issues.

ADDITIONS ARCHITECTURAL FEATURES

The one-story classroom addition will consist of ten (10) new first classrooms and new restrooms for both boys and girls. The addition will be composed of heavy duty construction elements and finishes, including load-bearing block and brick walls, durable sheet composition tile floors (with ceramic tile and base in toilet rooms), and high gloss acrylic latex paints on all walls. 2' x 2' lay-in acoustical ceiling tile systems will be integrated into all new spaces.

The new main office will have natural oak millwork and front office reception area will have a Corian countertop. It is anticipated that the front office areas will be constructed of durable gypsum board walls, rather than concrete block. The nurse's space will have plastic laminate countertops and cabinetry, and will include an office area for the nurse, an accessible restroom with ceramic tile flooring and a rest area with three (2) cots and curtain dividers for privacy. A sloped roof over the addition will likely be a lifetime warranted architectural shingle with an energy star rating. The exterior brick masonry will match the color and texture of the existing building's masonry façade with a new color to complement the lighter brick. The additions will also have decorative pre-cast window sills and header bands similar to the existing buildings. Most interior doors will be hollow metal, painted and fit heavy duty hardware. Exterior service doors will be galvanized hollow metal, with panic hardware and heavy duty fittings and features. Most of the other interior and exterior doors will be aluminum and glass entrances, framed with aluminum and glass windows.

C. STRUCTURAL SYSTEMS

DESIGN CRITERIA

All structures will be designed in accordance with 2003 International Building Code/2009 Connecticut Supplement. The minimum design criteria as provided by the code, includes dead, live, and gravity loads, and wind and seismic loads. Dead loads consist of the weight of architectural, structural, mechanical and electrical systems. Live, wind and seismic loads are outlined in the "Design Criteria" following this narrative. The proposed structure shall be designed in accordance with the International Building Code (IBC) and Connecticut State Building Codes to withstand winds to 95 mph and roof loading from drifting of snow.

SUPERSTRUCTURE

Typical New Foundations: A geotechnical report providing recommendations for the foundation system, excavation and backfilling requirements shall be prepared prior to commencing with the design and shall be incorporated into the design of the building foundations.

Foundations are assumed to consist of exterior reinforced concrete walls on continuous spread wall footings. New exterior columns will be supported on reinforced concrete piers supported on reinforced concrete spread footings. Interior columns will be supported on isolated reinforced concrete piers and isolated reinforced concrete spread footings.

Typical Floor Slabs on Grade: 5" thick concrete slab reinforced with 6x6-W2.9xW2x.9 welded wire fabric supported on continuous steel wire chairs, placed over a 15 mil vapor retarder on a minimum of 6" of 3/4"(-) crushed stone fill. All concrete for the slabs on grade shall have a moisture vapor reducing admixture, i.e. □Barrier 1".

Typical Supported Floor Construction: 3 1/2" normal weight concrete floor slab on 2 inch, 20 gage galvanized composite metal floor deck (total slab depth = 5") reinforced with 6x6-W2.9xW2x.9 welded wire fabric supported on continuous steel wire chairs, on steel framing consisting of composite steel beams and girders supported by steel columns.

Typical New Roof Structure: The roof shall consist of 20 gage, 1-1/2 inch galvanized metal roof deck on open web steel joists and steel beams supported on steel roof girders on columns

LATERAL LOAD RESISTING SYSTEM

Lateral load resistance to horizontal wind and seismic loads will be provided by either masonry shear walls, moment frames or concentric braced frames. In order to transfer horizontal (wind and seismic) loads to the lateral load resisting system, horizontal diaphragms will be provided by the metal floor and roof deck system.

DESIGN CRITERIA

1. 2003 International Building Code/2009 Connecticut Supplement

2. Design Live Loads:

   Minimum Live Loads:

Offices	50 psf
Classrooms	40 psf
Storage	125 psf
Stage	125 psf
Corridors (First floor)	100 psf
Corridors (above First Floor)	80 psf
Lobbies	100 psf
Stairs	100 psf
Partitions	20 psf

   Snow Loads:

   Roof, Flat Snow Load,

   $Pf = 0.7\ Ce\ Ct\ I\ Pg\ I = 20.8$ psf $=$ 30 psf min.

   ($Pg = 35$ psf, $Ce = 0.9$, $Ct = 1.0$, $I = 1.1$)

   Snow Drift Load:

   In accordance with Section 1608.7

3. Wind Load Criteria: Refer to ASCE 7-02, "Minimum Design Loads for Buildings and Other Structures"

   $P = q\ GCp - qi\ (G\ Cpi)$

Basic Wind Speed, V:	95 mph
Exposure Category:	B
Importance Factor, Iw: (Category III)	1.15
Mean Roof Height, h	TBD

4. Earthquake Load Criteria: Refer to Chapter 9 of ASCE 7-02, "Minimum Design Loads for Buildings and Other Structures"

   Moment resisting frame system - masonry shear walls and concentric braced frames

   $S_s = 0.233$

   $S_1 = 0.064$

   S_{ds} = TBD

   S_{d1} = TBD

Seismic Use Group II	
Seismic Design Category B	
Importance Factor, Ie (Category III)	1.25
Soil Site Class C or D (TBD)	
Response Modification Factor, R	3.0
Deflection coefficient, Cd:	3.0

D. MECHANICAL ,ELECTRICAL, PLUMBING AND FIRE PROTECTION SYSTEMS

General

Since this project is classified as a "Renovate-as-New" (i.e. "renovation", as defined by Section 10-282 of the Connecticut General Statutes), all heating, ventilation and air conditioning systems will be new except where specific components can be retained with the presumption that they will have a life cycle of at least twenty years. Additionally, all systems will be designed in accordance with Connecticut's High Performance Building Regulation.

Construction phasing will present significant challenges since the school will remain occupied during construction, and the contract documents will delineate the general division of system service areas.

Existing Conditions

Space heating for the building is provided by two, oil-fired hot water boilers – one is part of the original construction and one was installed as part of the 1976 addition. Combustion air is provide by means of natural ventilation and does not appear to be code compliant.

Hot water is delivered to finned tube radiators in classrooms and other areas, and to air handling unit coils, other terminal heating equipment, and a domestic water heat exchanger. Ventilation for classrooms is provided by a general exhaust system that draws air from classrooms through sidewall grilles along the corridor wall and in some cases through closet grilles. This system while widely employed in the past is impractical during the heating season because all exhausted air must be offset by unconditioned cold air passing through open windows or openings in the building envelope.

Heating and ventilation for the gymnasium and locker area is provided by air handling equipment dedicated to those spaces. Several areas (offices, nurse's suite, data closet) with special requirements are served by split system air conditioning units. Roof exhaust fans provide exhaust required for toilet rooms, janitor's closets, storage rooms, and other miscellaneous areas.

Automatic Temperature Control is accomplished throughout the facility by a pneumatic system. While the air compressor appears to be in excellent condition, the system should be considered to be near the end of its use life and certainly is inconsistent with high performance building design. This system appears to be functioning properly and may be kept in service during the construction process.

Proposed Systems

The performance of proposed new systems will be evaluated through the use of EQuest energy modeling software and will need to perform at least 21% more efficiently than the established baseline case (ASHRAE 90.1 – 2007). Preferably, the system will be able to achieve the energy performance required to reach the next tier that is optional – 24.5% better than baseline. However, the lack of natural gas and unlikely feasibility (due to cost) of a ground source heat pump (geothermal) system may make that goal unrealistic.

Heating and ventilation will be provided for all areas of the building. A new heating plant will consist of two oil-fired boilers and each will be rated for approximately seventy percent of the peak building load. Combustion and ventilation air is required and may be supplied by openings to the outside (e.g. wall louvers or gravity ventilators) and/or by combustion air fans. A new underground fuel oil storage tank with piping, transfer pumps and electronic gauging/monitoring will be required.

Hot water supply will be delivered to all areas of the building via pumps equipped with variable frequency drives (VSD's). Hot water will be supplied to finned tube radiators in classrooms and other areas, cabinet heaters, energy recovery ventilator hot water coil, air handling unit hot water coils, unit heaters and convectors. Each Boiler will have a dedicated secondary circulator to minimize the risk of thermal shock.

Ventilation will be accomplished through the use of energy recovery ventilators (ERV's). This equipment utilizes a heat exchanger to capture a portion of heat from the exhaust air stream and delivers tempered air to the occupied spaces. This equipment may be roof mounted or may complement indoor air handling units.

Air conditioning will be provided for the office block which includes the following: Principal's Office, Main Office, Nurse's Suite, specialist's rooms (reading/language, psychologist, speech, social worker), Conference Room, Media Center, Computer Room, Staff Lounge, Copy Room, Telephone/Data Closet, Network Closet, Occupational Therapy/Physical Therapy, Resource Room, and Staff Work Room. Multiple air handling units will utilize refrigerant coils and associated air cooled condensing units will be mounted on the roof our on the site near the building. This concept is recommended over a central air handler with variable air volume control because of the varied uses and schedules of the spaces served. It's possible that compliance with the High Performance Building Regulation can be accomplished only through the use of a central chiller plant but every effort will be made to avoid this approach to handle a relatively small cooling load – approximately thirty (30) tons.

Air conditioning will be considered as an option for the Cafeteria, Kitchen, and Gymnasium, and these areas require an approximate total of forty (40) tons. If this option is selected, use of a central packaged air cooled chiller would be appropriate. The chiller capacity will be something less than seventy tons because of the non-simultaneous use of the areas served by the system.

Finally, Classrooms (including Music and Art) can be considered as an additional option to provide a facility that is fully air conditioned. A central chilled water plant having a 160 ton capacity will be employed and will consist of a high efficiency magnetic bearing chiller in conjunction with a roof mounted cooling tower. Chilled water will be distributed via a dedicated chilled water loop to feed air handling unit cooling coils and chilled beams. Chilled water will also be supplied to Active Chilled Beams serving the Science Addition which will also be considered as part of a Dedicated Outside Air System (DOAS)/Chilled Beam Alternate to the Base HVAC Systems (VAV Air Handling Units).

Use of a ground source heat pump system – described below under Sustainable Design Considerations – can be employed to heat and cool the entire building or to serve only a portion of the building. The most effective payback will result from areas that are utilized throughout the year and that would make the central office area a good candidate for this system. Approximately 15 closed loop bores (475 feet deep) would be spaced twenty five feet on center and would be piped together to constitute the earth loop. The building loop would deliver this water to heat pumps dedicated to individual spaces, and the heat pumps would provide warm or cool air depending on need. Unfortunately, the initial cost of this system would bring the project out of budget, and its implementation is not being recommended at this time. Toilet Rooms, Locker Rooms, Janitor's Closets and other areas will be provided with exhaust as required by the Building Code. Automatic Temperature Controls/Energy Management System: A Direct Digital Control (DDC) type Energy Management will be provided for the facility to meet the facilities' requirements. The system may or not be compatible with existing systems serving other town facilities. Compatibility with existing systems will be determined based on the owner's requirements with the cost of a proprietary system being a consideration. This system is further described under Sustainable Design Considerations.

SUSTAINABLE DESIGN CONSIDERATIONS

An Energy Management System (EMS) provides a building owner with the ability to monitor, control, and adjust all HVAC (along with plumbing and electrical if desired) systems from a central location. An operator workstation consisting of a personal computer and printer can be located in the building, and this station can be accessed remotely via the internet. The owner can set occupancy schedules, adjust setpoints, and monitor trouble/alarm conditions in an efficient manner with this tool. Features such as night setback, holiday scheduling and weekend scheduling will be included to allow the system to minimize energy expenditure during unoccupied periods. An alarm feature will be added which can remotely notify facilities staff of any pre-determined, alarm conditions.

Demand Controlled Ventilation is a method of insuring adequate ventilation for building occupants, and for eliminating unnecessary ventilation. The ventilation process requires a substantial amount of energy because outside air needs to be heated or cooled to acceptable levels. Energy is conserved by controlling ventilation rates based on the actual number of occupants based, indirectly, on the use of carbon dioxide (CO_2) as an indicator of occupant load. Concentrations of CO_2 are measured by a sensor located in the space and the outside air dampers are modulated to maintain concentrations below an established baseline. This technique can be applied throughout the building, and is especially effective in high occupancy spaces that are not continuously occupied (e.g. gymnasiums, auditoriums, cafeterias, and media centers). Demand Controlled Ventilation can be easily implemented by the addition of sensors and required programming when an Energy Management System is provided.

Chilled Beams offer an energy efficient means of delivering HVAC to a space while providing zone control for individual rooms. These devices are supplied with partially conditioned primary air that satisfies ventilation requirements, and this air discharges through nozzles to induce room air through a coil that receives hot or chilled water. This induction process replaces the need for a fan to deliver air to the space. This results in an efficient and low-maintenance solution. Also, the cost of ductwork required to deliver ventilation air to all spaces is much less than for a conventional air distribution system. Proper system balancing and control setup is required to prevent condensation from occurring.

A Ground Source Heat Pump (GSHP, also known as geothermal) system utilizes the earth a heat source in the heating season and as a heat sink in the cooling season. Water-to-air type heat pumps will be provided for individual areas. Water from the ground loop will be circulated through the bore field to a manifold located in an underground vault, and will be supplied to each of the heat pumps. The ground loop circulating pumps will be located in the mechanical room.

Incentives, Grants, and other programs may be available to offset construction costs.
They may be in the form of rebates for implementing certain energy conservation measures such as high efficiency air conditioning equipment and premium efficiency motors. In addition, other incentives may be available for high efficiency systems by participating in a utility companies comprehensive design program. The incentives offered are designed to offset some or all of the additional cost for higher efficiency systems. Possible funding sources will be investigated as part of the design process.

On-site Energy Generation of electricity can be accomplished through the use of micro-turbines fired by propane or natural gas, or through the use of fuel cells that also utilize propane or natural gas. These systems are cost effective only when waste heat from the electrical generation process can be utilized for space heating , pool water heating, domestic water heating, or other use. The micro-turbine can be coupled with an absorption chiller which would utilize the waste heat to provide cooling. Due to the high installation and maintenance costs, the feasibility of such systems is dependant on the building meeting certain operational requirements (i.e. a constant demand for hot water throughout the year) as well as the

availability grants, tax credits and utility incentives. The present generation fuel cells require an extensive overhaul on a 5 year cycle, but the next generation - expected in the near future - will have an improved maintenance cycle of 8 to 10 years. On-site energy generation is not a viable option for the Crystal Lake School project.

Energy Recovery can be accomplished through a variety of technologies, and for this project, the use of energy recovery wheels is anticipated. These devices capture a portion of energy (both sensible and latent) from the exhaust air stream and transfer it to the supply air stream. These products can operate at efficiency levels around eighty percent.

Refrigerants used in air conditioning systems will be hydroflourocarbons having low ozone depletion and global warming potentials. Equipment will most likely use HFC-410A or HFC-134a.

Premium Efficiency Motors will be utilized wherever their application is feasible.

ELECTRICAL CONSIDERATIONS

Demolition

Existing electrical systems will be removed or modified as required to complete new construction and renovations to the existing building. Based on achieving a 20 year life of all equipment as defined in the "renovate as new" scope, we anticipate that nearly all existing electrical equipment, devices, systems and wiring will be removed. Where conduit and boxes are concealed in existing walls to remain, these will be reused (with new wiring and devices) or abandoned (with the wiring cut or removed and blank plates installed on all boxes). All electrical equipment in the remote well water equipment building will remain.

Power Distribution

The existing electrical service is rated at 120/208 Volt, 3 Phase, 800 Amp. Preliminary calculations based on National Electrical Code requirements and a fully air conditioned building indicate the need for a new 208/120 volt, 1600 amp, 3-phase electrical service. If the service is not sized to accommodate air conditioning, this new service could be reduced to 1200 amps. The cost for both options is shown in the attached schematic estimate. New primary service is proposed to feed from an existing utility pole (located on Sandy Beach Road) to a new pad mounted utility transformer on the east side of the building. Preliminary layouts indicate that the new main electrical equipment can be installed in the Boiler Room. A smaller distribution panel will be installed in the Mechanical Room near the Cafeteria and several other sub-panels will be located in utility spaces throughout the facility.

A new diesel fired emergency generator will be included to provide back-up power for both the new fire pump and the emergency shelter function of the facility. The generator will be sized to allow for essentially full operation of the shelter designated areas. The generator and distribution will also be sized to provide emergency egress lighting and heating (freeze protection) throughout the facility. Preliminary calculations indicate that the required generator size will be 150 kW. The unit will have an integral (sub-base) diesel tank to hold approximately 24 hours of fuel. The existing 48kW propane fired generator installed adjacent to the remote water equipment building is not large enough to serve the proposed emergency needs of this facility.

The unit is relatively new and further evaluation will be done to determine if it should remain to serve one portion of the emergency load or if it can be utilized elsewhere in the district. The existing automatic transfer switch located in the Boiler Room is rated at 250 amps and can be retained to work with the new

generator.

Branch circuits will be armored (type MC) cable where concealed and conduit or surface raceway where exposed. We would require that all electrical installations be concealed where possible but would allow new installations on existing masonry walls to be surface raceway. Branch circuits will be provided for all HVAC, receptacle, lighting and building loads.

Lighting

New lighting systems will be provided for the entire building. All systems will be designed to maximize energy efficiency and to qualify for utility rebates. New fluorescent fixtures will utilize electronic ballasts and T-8 or T-5 fluorescent lamps. Use of LED lighting systems has been evaluated and will be incorporated where it can improve lighting performance or reduce maitained cost. Gasketed fixtures will be utilized in the Kitchen and vandal resistant fixtures will be utilized where deemed appropriate.

Pendant mounted linear fluorescent fixtures will be utilized in classrooms to provide indirect or a combination direct and indirect lighting. These fixtures will provide flexible, energy efficient lighting and will create minimal glare on computer screens. Recessed glare control fixtures will be utilized in any areas where ceiling heights sufficient for pendant mounting cannot be achieved. Control of illumination levels will be provided by multiple switches that provide one third, two thirds, and full capacity. Automatic daylighting controls will also be considered where they can be effectively applied. Occupancy sensors will be utilized to automatically turn off fixtures when a room is not in use. We do not currently plan to provide dimming controls for lighting in most areas. The need for dimming control in the conference room, offices, computer room and media center will be coordinated with the Owner. Also, the exact style and color of fixtures will be coordinated during design with the Owner.

All exterior lighting will be new. Exterior lighting will consist of full cutoff style building mounted fixtures and standard "shoebox" style pole lights for the parking areas. We also anticipate the use of bollards or other specialized exterior fixtures in a few critical spaces. Exterior lighting control will include both photocell and microprocessor based time clock. Most or all exterior lighting will utilize LED lamps for energy efficiency and maintenance reasons.

Exit & Emergency Lighting

New emergency lighting will be provided through the use of the emergency generator and emergency distribution system. Emergency lighting relays will be used to monitor normal lighting power and force emergency egress lights on if power is lost. Use of the generator for emergency lighting eliminates the need for future maintenance of dozens of battery powered units spread throughout the facility. Use of the lighting relays will allow emergency egress lights to be shut off thus eliminating the need for 24 hour "night lighting". Exit signs will be mounted at conventional heights and also near floor level in assembly areas where required by code. Additional signs will be provided to mark areas of refuge and accessible ext routes. All egress signage will be powered via the emergency distribution system.

Communication Systems

Installation of an entirely new integrated communication system is required. Basic system functions will

include telephone, intercom, public address, scheduling, and central clock. Each classroom will be provided with a wall-mounted handset, emergency call button, clock and ceiling speaker. The handset will be utilized to communicate internally with the office or another classroom, and it can be programmed to allow use of external telephone lines. The emergency button is used whenever a teacher is unable to hold the handset, and activation of this button provides for direct communication with the office via the speaker. Administrative offices will receive enhanced desktop phones and additional outside telephone lines as required. Use of voice-over-internet-protocol (VOIP) will be coordinated with the Board of Education's IT department. Public address speakers will be installed throughout the building and in selected exterior locations. We anticipate the use of a wireless master clock system for clock correction. The Owner will have the option of hard wired (120 volt) clocks or battery powered clocks with a 5 year battery pack. While requiring some maintenance, the battery units do allow flexibility in locating the clocks.

A dedicated sound system will be provided for the Gymnasium. Additional smaller sound systems can be considered for the Cafeteria and/or Media Center if requested by the Owner. These systems will facilitate announcements, presentations and music distribution. They will include wireless microphones, amplifiers, CD players and other inputs as coordinated with the Owner.

Local area network equipment and connectivity will be provided throughout the facility. This will consist of hard wired category 6 network jacks in classrooms and offices and tied to central rack mounted distribution equipment. We anticipate the need for one main distribution frame (MDF) and one intermediate distribution frame (IDF) linked with a fiber optic backbone cable. Each MDF/IDF will consist of a floor mounted rack, fiber optic patch panel, network switches, patch panels and a rack mounted UPS. Each will have capacity for the number of data ports associated with that location. The exact requirements for data head end equipment, the possible reuse of any existing equipment, and the desire for wireless network coverage will be coordinated with the Board of Education's IT department.

Video distribution will be provided to each classroom and other requested locations. We anticipate that video distribution will be run over the local area network. In most spaces, this video would be connected to the Teacher's PC and sent to the room's digital projector. The Owner would need to coordinate with a local cable provider to install service to the building.

Fire Alarm

A complete new fire alarm system will be provided. Automatic fire detection will include area smoke detectors or heat detectors in all corridors, common spaces and high hazard areas. The system will also monitor the Kitchen hood extinguishing system, sprinkler system, and emergency generator. Audible and visual notification devices will be provided throughout the facility. Voice evacuation will be utilized in the Gymnasium. The fire alarm system will be used to control any door holding equipment or smoke dampers required in the facility.

Sustainable Energy

Use of on-site renewable energy for the facility can result in cost savings over time in addition to serving as a teaching tool. Installation of a photovoltaic array system generating electricity from sunlight could be evaluated but appears unlikely to fit into the projected construction budget.

PLUMBING SYSTEMS

Demolition

The "Renovate-As-New" status of this project requires that all systems have the operating characteristics, and life expectancy of new systems. It is difficult to provide that "new" designation to any existing plumbing systems at this stage in the design process, and it is assumed that all systems will be removed or, where appropriate, abandoned. It is possible that this position could be altered in very limited areas (underslab sanitary main piping, and above ceiling vent piping, for instance) if proper testing is conducted to verify the integrity of specific components, and if the component where located does not interfere with required demolition and or new installations.

Removals within the building will include:

- All domestic water piping systems back to the point of building entry from the remote wellwater treatment/pumping building, including water heating equipment and accessory devices
- All sanitary/waste/vent piping systems above slab; all sanitary/waste/vent piping systems below slab which interfere with new work. All disused existing san/waste/vent piping below slab will be cut and capped with no deadends remaining, per code
- All storm drainage piping systems
- All propane fuel gas piping systems
- All plumbing fixtures

Site-related work includes:

- Removal of the aboveground propane tank/pressure regulator serving the kitchen in its present location; this installation is fairly new and may be evaluated by the propane supplier for reuse at the new kitchen location, if project phasing allows a speedy kitchen operations changeover.
- Removal of site sanitary piping as required to allow for disconnecting the building from the existing site sewage disposal system, and connecting to street (city) sewer.
-

Domestic Water Systems

The existing domestic water feed from the remote well water equipment building into the basement Mechanical Room will remain.

A new distribution system for hot and cold water will consist of NSF-compliant PEX (cross-linked polyethylene) tubing with crimped joints, where allowed by code. Where PEX is prohibited, pipe material shall be copper tubing with lead-free soldered joints. Bronze isolation valves (full-port ball valves) will be provided throughout the system as required by the Plumbing Code. Isolation valves will be provided in additional locations to facilitate maintenance operations. All piping will be insulated per International Energy Conservation Code requirements.

All fixture types will conform to HPBS standards for their respective maximum flow rates. In addition, fixtures not specifically listed in HPBS standards shall be fitted with water conserving controls (using less water than standard manufacture) wherever practical.

FIRE PROTECTION SYSTEMS

Presently, the building is not served by a sprinkler system. Full sprinkler protection will be required throughout the building, both new and existing areas. As no utility water is available and the school is supplied from its own well system, fire protection water will have to be stored on site and "topped off" under normal circumstances from the well water system, with provision for rapid replenishment from an outside source such as water truck. The well water makeup to the tank will be by indirect means.

The new sprinkler system's tank storage requirement is 11,250 gallons [(Kitchen: 1050 SF x .15 gpm/SF x 60 minutes) + Kitchen Storage: 150 SF x .20 gpm/SF x 60 minutes) = 11,250 gallons] minimum. However, a larger tank size is required because the entire nominal tank volume will not be available for use. A nominal 15,000 gallon tank is recommended. The size will be finalized after conferring with the local fire chief and fire marshal. The tank will be underground, either a cylindrical horizontal steel or reinforced, lined concrete tank conforming to NFPA 22 "Standard for Water Tanks for Private Fire Protection". The tank will have adequate cover to protect from freezing, and will be located in the courtyard near the basement mechanical room. The remote tank fill connection for tanker truck will be located south and outside the building footprint, near the new Link between old and new portions of the building.

A fire pump is required, located in the basement mechanical room. Tentative required minimum rating is 400 GPM at 80-100 psi. Suction from the storage tank will be gravity via a vortex suction plate at the tank base. Net Positive Suction Head for the fire pump will be provided by elevation difference between the tank outlet and fire pump inlet. The fire pump will supply one wet alarm check riser serving separate sprinkler zones for the main and basement levels. Total main level square footage is approximately 50,500 SF. Possible additional sprinkler zoning and protection of exterior egress paths will be reviewed and coordinated with the fire marshal. Each sprinkler zone will have a supervised control valve, flow switch, and inspector's test provision. Sprinkler mains and branch piping will be concealed wherever possible and where these components must be exposed, they will be located to minimize aesthetic impact. A combination of pendant, upright, and sidewall heads will be provided. Where dropped ceilings are provided, sprinklers will be recessed pendent with chrome finish or concealed pendent type with white cover plate, as determined by school officials. In areas without ceilings, sprinklers will be upright type, brass. Sprinkler guards will be provided where sprinklers are subject to mechanical damage or vandalism. No dry sprinkler systems are anticipated, except in isolated small areas, where protection will be by dry type sprinklers fed from local wet pipe systems. Since the height from the lowest level of fire department access to highest occupied floor level is less than fifty feet, and the existing-to-remain performance platform is less than 1000 square feet (950 SF), standpipes are not required for the building. The building sprinkler systems will have fire alarm interface, full-drain-down capability, main test and zone test assemblies, and a fire department connection meeting Ellington Fire Department requirements for type and location. A fire suppression system will be provided for the new kitchen cooking hood(s). When activated, the hood fire suppression system will cause power to the electric and/or gas cooking equipment under the hood to shut off.

Sustainable Design Considerations: Not applicable to this section.

Town of Ellington

Crystal Lake Elementary School

SPACE PROGRAM TEMPLATE

January 15, 2013

SPACE COMPONENT LEGEND
Existing Space
MP 'Baseline Program' Generated Space Component or Square Footage
S/P+A Generated/Modified Space Component or Square Footage
Final Proposed Square Footage

Projected Enrollment - 337 Students SPACE COMPONENT	No.	Area NSF	Total NSF	SCHEMATIC DESIGN - Proposed Crystal Lake School PROGRAMMED SQUARE FOOTAGE REQUIRED No.	SD Areal NSF	SD Total NSF	2013 sch - Final Actual S.F.
ADMINISTRATION							
Principal office	1	130	130	1	200	200	204
Main Office (secretary, waiting, etc.)	1	334	334	1	400	400	408
Conferecne Room	1	250	250	1	220	220	246
Copy Room	1	72	72	1	100	100	198
Teachers Mailbox Area	1	included	0	1	30	30	30
Secure Storage	0	0	0	1	75	75	63
Total			**786**			**1025**	**1149**
FACULTY							
Staff Lounge & Dining	1	215	215	1	450	450	434
Staff Work Room	1	212	212	1	300	300	250
Total			**427**			**750**	**684**
FOOD SERVICE							
Cafeteria (3 waves)	1	1747	1747	1	2000	2000	2,218
Food Prep Kitchen	1	404	404	1	1200	1200	987
Office	1	included	0	1	100	100	101
Lockers / Restrooms	1	43	43	1	75	75	93
Storage	1	180	180	1	150	150	140
Storage (with outdoor access only)	1	18	18	1	0	0	0

Projected Enrollment - 337 Students SPACE COMPONENT	No.	Area NSF	Total NSF	No.	SD Areal NSF	SD Total NSF	2013 sch - Final Actual S.F.
				SCHEMATIC DESIGN - Proposed Crystal Lake School			
				PROGRAMMED SQUARE FOOTAGE REQUIRED			
Total			**2392**			**3525**	**3539**
GUIDANCE							
School Psychologist	1	224	224	1	200	200	187
Social Worker	0	0	0	1	100	100	98
Total			**224**			**300**	**285**
LIBRARY / MEDIA CENTER							
Circualtion Area	1	1781	1781	1	2800	2800	2,666
Workroom	1	included	0	1	included	0	0
Student Seating	1	included	0	1	included	0	0
Reading Area	1	included	0	1	included	0	0
Computer lab	1	918	918	1	750	750	712
Total			**2699**			**3550**	**3378**
NURSE							
Office Area (waiting, etc.)	1	198	198	1	250	250	238
Cots	2	included	0	2	40	80	80
Exam / Isolation Room	0	0	0	1	100	100	146
HC Lavatory	1	35	35	1	55	55	49
Secure Storage	1	46	46	1	50	50	49
Total			**279**			**535**	**562**
PHYSICAL EDUCATION & HEALTH							
Main Gymnasium	1	4541	4541	1	4500	4500	4,504
Spectator Area	0	0	0	1	250	250	308
Gymnasium / Chair Storage	1	308	308	1	200	200	308
P.E. Storage	2	90	180	2	125	250	213
Rec. Dept. Storage	1	included	0	0	0	0	0
Boys Toilet Room	1	153	153	2	302	604	153
Girls Toilet Room	1	153	153	2	302	604	153
Boys Locker Room	1	191	191	2	302	604	191
Girls Locker Room	1	191	191	2	302	604	191
Boys showwer Room	0	0	0	1	24	24	24
Girls Shower Room	0	0	0	1	24	24	24
P.E. Staff Office	1	148	148	1	100	100	90
P.E. Staff Shower Room	1	29	29	0	0	0	0
Staff / Coaching Toilet Rooms	2	24	48	0	0	0	0
Total			**5942**			**7764**	**6159**

Projected Enrollment - 337 Students SPACE COMPONENT	No.	Area NSF	Total NSF
CLASSROOMS			
Kindergarten	1	1781	1781
Kindergarten HC Toilet	0	0	0
1st Grade Classroom	2	777	1554
1st Grade Toilet	2	13	26
K-1 Classroom	0	0	0
K-1 HC Toilet	0	0	0
2nd Grade Classroom	2	787	1574
2nd Grade Toilet	2	13	26
3rd Grade Classroom	2	795	1590
4th Grade Classroom	2	790	1580
2-4 Classroom	0	0	0
5th Grade Classroom	0	0	0
6th Grade Classroom	0	0	0
5-6 Classroom	0	0	0
Total			**8131**
MUSIC			
Platform / Stage	1	798	798
Classroom	1	stage	0
Music Storage	1	57	57
Total			**855**
ART			
Classroom	1	cafeteria	0
Storage	0	0	0
Kiln	0	0	0
Total			**0**
SCIENCE			
Classroom / Lab	0	0	0
Storage	0	0	0
Total			**0**
SPECIAL EDUCATION			
Resource Room (learning disabilities)	1	462	462
OT/PT Therapy Room	0	0	0
Speech / Language	1	125	125
Math Intervention (4 students, storage)	1	209	209
Reading / Langauge Arts Classroom	1	359	359
Total			**1155**

SCHEMATIC DESIGN - Proposed Crystal Lake School PROGRAMMED SQUARE FOOTAGE REQUIRED			
No.	SD Areal NSF	SD Total NSF	2013 sch - Final Actual S.F.
2	1000	2000	**1,969**
2	55	110	**90**
2	900	1800	**1,746**
2	55	110	**90**
1	900	900	**875**
1	55	55	**45**
2	900	1800	**1,681**
0	0	0	**0**
2	850	1700	**1,678**
2	850	1700	**1,613**
1	850	850	**839**
2	850	1700	**1,589**
2	850	1700	**1,579**
1	850	850	**790**
		15275	**14584**
?	0	0	**0**
1	1000	1000	**884**
1	140	140	**184**
		1140	**1068**
1	1000	1000	**1,211**
1	250	250	**252**
1	100	100	**147**
		1350	**1610**
1	1000	1000	**986**
1	150	150	**70**
		1150	**1056**
1	500	500	**555**
1	300	300	**404**
1	150	150	**135**
1	300	300	**333**
2	200	400	**398**
		1650	**1825**

Projected Enrollment - 337 Students SPACE COMPONENT	No.	Area NSF	Total NSF	No.	SD Areal NSF	SD Total NSF	2013 sch - Final Actual S.F.
				SCHEMATIC DESIGN - Proposed Crystal Lake School			
				PROGRAMMED SQUARE FOOTAGE REQUIRED			
PHYSICAL PLANT							
Student Toilets	2	138	276	8	80	640	542
Staff Toilets	3	30	90	4	40	160	187
Custodial Office	0	0	0	1	120	120	100
Janitors Closet	2	36.5	73	3	40	120	73
Boiler Room (lower Level)	1	514	514	1	514	514	514
Mechanical Room (upper level)	1	127	127	1	514	514	127
Incinerator (lower level)	1	42	42	1	71	71	42
Electrical Equipment (main floor)	1	74	74	0	0	0	0
Pump Room (lower level)	1	66	66	1	66	66	66
Gen. Storage	1	92	92	1	300	300	380
Book Storage	0.5	159	79.5	1	150	150	92
PTO Storage	0.5	159	79.5	1	100	100	102
Tele/Data Room	0	0	0	0	0	0	71
Network/AV room	1	69	69	1	100	100	95
Outdoor Storage Shed	2	0	0	2	0	0	0
Total			1582			2855	2391
Total Net Square Footage			24,472			40,869	38,290
Total Gross Square Footage			32,542			50,892	51,217
Net / Gross Ratio			75.20%			80.31%	74.76%
Addition Square Footage (gross)						18,350	18,675

Crystal lake Elementary School
State Project No. 048-0058 EA/RR/PS
Max. Reimbursement Rate = 58.21%

SPACE STANDARDS WORKSHEET

This worksheet should be completed and submitted with the application for any N (new), E (extension), A (alteration), or RENO (renovation) project, or combination of such types of project.

State Standard Space Specifications
Grades

Projected Enrollment	Pre-K and K	1	2	3	4	5	6	7	8	9	10	11	12
	Allowable Square Footage per Pupil												
0 - 350	124	124	124	124	124	156	156	180	180	180	194	194	194
351 - 750	120	120	120	120	120	152	152	176	176	176	190	190	190
751 - 1500	116	116	116	116	116	148	148	170	170	170	184	184	184
Over 1500	112	112	112	112	112	142	142	164	164	164	178	178	178

1. Under the column headed "Projected Enrollment", find the range within which your school's highest projected 8 year enrollment falls.
2. Using the figures on that line, complete the grid below for only those grades housed within the school.

Pre-K		6	152
K	120	7	
1	120	8	
2	120	9	
3	120	10	
4	120	11	
5	152	12	

(a)	Total (grades Pre-K through 12)	904
(b)	Number of grades housed	7
(c)	Average [(a)/(b)]	129.14
(d)	Highest Projected 8-year Enrollment	353
(e)	Maximum Square Footage [(c) x(d)]	45,587

3. Total square footage at completion of project:
   a. Existing area constructed pre-1950. 0
   b. Multiply "a." by 80% 0
   c. Area (at completion of project) constructed1950 or later. 31,271 + 18,139 = 49,410
   d. Square footage for space standards computation (b+c). 49,410

If line 2(e) is greater than line 3(d) there is no grant reduction.

If line 3(d) is greater than line 2(e), divide line 2(e) by line 3(d). 92.26% *

* This factor will be used to reduce total eligible costs because of space in excess of the maximum eligible for reimbursement.
If a project exceeds the standards solely as the result of extraordinary programmatic requirements, the superintendent may submit a request to the Commissioner for a waiver. A detailed list of space allocations for all extraordinary programs with explanations must be included with the request.

Net Reimbursement = 53.70%

Current Building Codes
State of Connecticut
Effective December 31, 2005

2005 State of Connecticut Building Code/2009 Connecticut Supplement
2005 State of Connecticut Fire Safety Code/2005 Connecticut Supplement
2003 International Building Code (Including CT Amendments)
2003 International Existing Building Code (Including CT Amendments)
2003 International Mechanical Code (Including CT Amendments)
2003 International Plumbing Code (Including CT Amendments)
2003 International Energy Conservation Code (Including CT Amendments)
2003 International Fire Code
2005 National Electrical Code (Including CT Amendments)
2003 NFPA 101 Life Safety Code (Including CT Amendments)
2002 NFPA 13 – Standard for the Installation of Sprinkler Systems
1996 NFPA 54 – National Fuel Gas Code
2003 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
1973 Uniform Federal Accessibility Standards (UFAS)
Section 504, Rehabilitation Act of 1973
2002 Connecticut Public Health Code
1999 Connecticut O.S.H.A. Regulations - Title 29 Dept of Labor
1991 Americans with Disabilities Act
- Title I Employment
- Title III Public Accommodations
SMACNA – IAQ Guidelines for Occupied Buildings Under Construction
PA 07-242 & PA 07-249 (Portions of these Public Acts that deal with sustainable design)
Title 29, Chapter 538 – Elevators, Escalators and Lifts
Title 29, Chapter 540 - Boilers and Water Heaters
Title 29, Chapter 541 – Building, Fire and Demolition Codes. Fire Marshals and Fire Hazards. Safety of Public and Other Structures.

RENOVATE AS NEW

Silver Petrucelli and Associates was requested to design the entire project to meet the "Renovate as New" modernization option that is offered by the State Department of Education under State Statute 10-282.

'Renovate as New' or simply 'Renovation'

-This concept was developed by the State to encourage Towns to renovate/update their aging, but well built, existing school structures in their entirety, rather than needlessly demolishing them and rebuilding new facilities at a higher cost and greater reimbursement rate from the state.

-The renovated school MUST be certified to 'last' 20 years from construction, which includes all systems (HVAC, electrical, plumbing), structure, equipment, finishes, etc.

-Most of these repairs, replacements and updates are reimbursed by the State at the Town's reimbursement rate.

HIGH PERFORMANCE BUILDINGS GUIDELINES

Public Acts 06-187 Section 70, 07-213 Section 5, 07-242 Section 10, and 07-249 Section 15 required the development high performance building regulations for state agency buildings and school buildings. The regulations address the construction of this project as noted below.

1. Renovation of a public school facility as defined in subdivision (18) of section 10-282 that is projected to cost two million dollars or more of which two million or more is state funding and is authorized by the General Assembly pursuant to chapter 173 on or after 1/1/09 must comply with state regulations.

These regulations were approved with technical corrections by the Regulation Review Committee on August 25, 2009 and submitted to the Secretary of State as required under the Connecticut General Statutes Sec. 4-172 on September 2, 2009.

SILVER/PETRUCELLI+ASSOCIATES
Architects and Engineers
3190 Whitney Avenue, Hamden, CT 06518-2340
Tel: 203 230 9007 Fax: 203 230 8247
silverpetrucelli.com

November 30, 2012

Benjamin Barnes
Office of the Secretary
Office of the Policy and Management
450 Capitol Avenue
Hartford, CT 06106

Re: Ellington Crystal Lake Elementary School
Expansion and Renovate as New
State Project No. 048-0058 EA/RR/PS

Dear Mr.Barnes:

This report represents the initial submission to demonstrate compliance of the above referenced project with the CT High Performance Building Standards. The design of the first phase of work is scheduled to be complete in June of 2013.

You will find attached to this letter a Design Team List in addition preliminary construction schedule.

Our design team has reviewed and understands the requirements set forth by the Connecticut Building Standard Guidelines Compliance Manual for High Performance Buildings and in State Statutes 16a-38k-1 through 16a-38k-9.

Please contact me with any questions that you may have on this submission.

Very truly yours,

Kenneth J. Sgorbati, PE, LEED AP
Principal/Engineering Manager

Cc: Public Building Commission, Ellington Board of Education, File

Connecticut Compliance Manual for High Performance Buildings

Compliance SD Checklist-Schools

CRYSTAL LAKE ELEMENTARY SCHOOL - EXPANSION & RENOVATE AS NEW

Mandatory Requirements

X	Section	Summary Description	Responsible Party	Approach	Documentation
X	16a-38k-3(a)	Building Commissioning	OWNER		
X	16a-38k-3(b)	Integrated Design Process	ALL PARTIES		
X	16a-38k-3(c)	Base Energy Performance 21% Better Than Code	ARCHITECT/ENGINEER	HVAC & Lighting Design	Energy Model, Mechanical & Electrical Plans & Specifications
X	16a-38k-3(d)	ENERGY STAR Products	ARCHITECT/ENGINEER	Specification of qualified EnergyStar products	Division 11 Specifications
X	16a-38k-3(e)	Indoor Air Quality Management Plan	CONSTRUCTION MGR		
X	16a-38k-3(f)	Water Efficiency	ARCHITECT/ENGINEER	Plumbing system design.	Plumbing Plans & Division 22 Specifications
X	16a-38k-3(g)	Recycling of Materials	ARCHITECT/OWNER	Indicate areas for collection/sorting of recyclables	Architectural Plans, Owner implementation
X	16a-38k-3(h)	Erosion and Sedimentation Control	CONSTRUCTION MGR		
X	16a-38k-3(i)	No Smoking Policy	OWNER		
X	16a-38k-3(j)	Integrated Pest Management Plan			
X	16a-38k-3(k)	CFC Refrigerant Ban or Phase-out Plan	ARCHITECT/ENGINEER	HVAC Design	Mechanical Plans & Division 23 Specifications
X	16a-38k-3(l)	Minimum Ventilation	ARCHITECT/ENGINEER	HVAC Design	Mechanical Plans & Division 23 Specifications
X	16a-38k-5(a)	Acoustical Standards	ARCHITECT/ENGINEER	Compliance with State Regulation	Per Specification
X	16a-38k-5(b)	Properly Locate Outside Air Intakes	ARCHITECT/ENGINEER	Architectural & HVAC Design	Architectural & Mechanical Plans
X	16a-38k-5(c)	Electronic Ignition on Natural Gas Equipment	ARCHITECT/ENGINEER	Plumbing & HVAC Design	Plumbing & Mech Plans; Div 22 23 Specifications
X	16a-38k-5(d)	Use of Low VOC Products	ARCHITECT/ENGINEER	Specification of low-emitting materials in Div 2-10	Division 2-10 Specifications, Implemented by Constr Mgr
X	16a-38k-5(e)	Environmental Site Assessment			
X	16a-38k-5(f)	HEPA Vacuuming	OWNER		

Building Standard Options

(A minimum of 28 of the following strategies must be implemented.)

		At least one measure in subsection (a) must be selected			
X	16a-38k-6(a)(1)	Energy Performance 24.5% Better Than Code	ARCHITECT/ENGINEER	HVAC & Lighting Design	Energy Model, Mechanical & Electrical Plans & Specs
	16a-38k-6(a)(2)	Energy Performance 28% Better Than Code			
	16a-38k-6(a)(3)	Energy Performance 31.5% Better Than Code			
	16a-38k-6(a)(4)	Energy Performance 35% Better Than Code			
	16a-38k-6(a)(5)	Energy Performance 38.5% Better Than Code			
	16a-38k-6(a)(6)	Energy Performance 42% Better Than Code			
	16a-38k-6(a)(7)	On-Site Renewable Energy – 3%			
	16a-38k-6(a)(8)	On-Site Renewable Energy – 7%			
	16a-38k-6(a)(9)	On-Site Renewable Energy – 10%			
X	16a-38k-6(a)(10)	Purchase Renewable Energy	OWNER	Energy Contract	
X	16a-38k-6(a)(11)	Energy Measurement and Verification Plan	ARCHITECT/ENGINEER	HVAC Design	Energy Model, Mechanical Plans & Specifications
		At least two measures in subsection (b) must be selected			
X	16a-38k-6(b)(1)	Install Permanent Indoor Air Monitoring Systems	ARCHITECT/ENGINEER	HVAC Design	Mechanical Plans & Division 23 Specifications
	16a-38k-6(b)(2)	Provide Increased Outdoor Ventilation			
	16a-38k-6(b)(3)	Building Flushout			
X	16a-38k-6(b)(4)	Composite Wood and Agrifiber Products	ARCHITECT/ENGINEER	Specification of products/assemblies with NAUF	Division 6 Specifications, Implemented by Constr Mgr
X	16a-38k-6(b)(5)	Individual Lighting Control	ARCHITECT/ENGINEER	Lighting Design	Electrical Plans & Division 26 Specifications
X	16a-38k-6(b)(6)	Individual Thermal Comfort Control	ARCHITECT/ENGINEER	HVAC Design	Mechanical Plans & Division 23 Specifications
X	16a-38k-6(b)(7)	Building Occupant Survey	OWNER	Administrative process.	HPB Compliance Manual
	16a-38k-6(b)(8)	Daylight Contribution			
	16a-38k-6(b)(9)	Visual Gazing – Views to the Outdoor Environment			
X	16a-38k-6(b)(10)	Mold Prevention	ARCHITECT/ENGINEER	HVAC Design	Mechanical Plans & Division 23 Specifications
X	16a-38k-6(b)(11)	Low VOC Furniture	ARCHITECT/ENGINEER	Phase 3 of 3	FFE, Furniture Specifications
X	16a-38k-6(b)(12)	Isolation of Chemical Use Areas			
X	16a-38k-6(b)(13)	Control of Particulates at Pedestrian Entryways	ARCHITECT/ENGINEER	Archtectural Design	
X	Section	Summary Description	Responsible Party	Approach	Documentation

		At least one measure in subsection (c) must be selected			
X	16a-38k-6(c)(1)	Reduce Total Potable Water Usage by 30%	ARCHITECT/ENGINEER	Selection of Plumbing Fixtures	Plumbing Plans & Division 22 Specifications
X	16a-38k-6(c)(2)	Reduce Water Consumption for Landscaping 50%	ARCHITECT/ENGINEER		
X	16a-38k-6(c)(3)	Eliminate Potable Water Usage for Landscaping	ARCHITECT/ENGINEER		
	16a-38k-6(c)(4)	Reduce Total Potable Water Usage by 50%			
		At least two measures in subsection (d) must be selected			
X	16a-38k-6(d)(1)	Maintain 75% of an Existing Building Structure	ARCHITECT/CONSTR MGR	Archtectural Design	Architectural Plans
	16a-38k-6(d)(2)	Maintain 95% of an Existing Building Structure			
	16a-38k-6(d)(3)	Re-use Existing Non-Structural Building Elements			
X	16a-38k-6(d)(4)	Recycle or Salvage 50% of Construction and Demolition Debris	ARCHITECT/CONSTR MGR	Construction Waste Management	Specifications/Construction Waste Mgmt Plan
X	16a-38k-6(d)(5)	Recycle or Salvage 75% of Construction and Demolition Debris	ARCHITECT/CONSTR MGR	Construction Waste Management	Specifications/Construction Waste Mgmt Plan
	16a-38k-6(d)(6)	Use 5% Refurbished, Salvaged, or Reused materials			
	16a-38k-6(d)(7)	Use 10% Refurbished, Salvaged, or Reused materials			
X	16a-38k-6(d)(8)	Use 10% Recycled Content Materials	ARCHITECT/CONSTR MGR	Use of materials with highest recycled content possible	Division 2-10 Specifications, Implemented by Constr Mgr
X	16a-38k-6(d)(9)	Use 20% Recycled Content Materials	ARCHITECT/CONSTR MGR	Use of materials with highest recycled content possible	Division 2-10 Specifications, Implemented by Constr Mgr
X	16a-38k-6(d)(10)	Use 10% Local Materials	ARCHITECT/CONSTR MGR	Use of regional materials <500 mile radius	Division 2-10 Specifications, Implemented by Constr Mgr
	16a-38k-6(d)(11)	Use 20% Local Materials			
	16a-38k-6(d)(12)	Use Building Materials Made from Short Harvest Cycle Plants			
X	16a-38k-6(d)(13)	Use Forest Stewardship Council (FSC) Certified Wood Products	ARCHITECT/CONSTR MGR	Use of FSC Certified Wood	Division 6 Specifications, Implemented by Constr Mgr
		At least two measures in subsection (e) must be selected			
	16a-38k-6(e)(1)	Re-develop a Local Site			
	16a-38k-6(e)(2)	Select a Site with Public Transportation Access			
X	16a-38k-6(e)(3)	Encourage Bicycle Transportation	ARCHITECT/ENGINEER	Installation of Bicycle Racks/Indication of Shower Areas	Architectural Plans and Specifications
X	16a-38k-6(e)(4)	Encourage Low-Emission Vehicle Use with Preferred Parking	ARCHITECT/ENGINEER	Application of preferred parking signage/protocol	Architectural/Civil Plans and Specifications
X	16a-38k-6(e)(5)	Encourage Car and Van-pooling	ARCHITECT/ENGINEER	Provision for vanpool and carpool parking	Architectural/Civil Plans and Specifications
	16a-38k-6(e)(6)	Protect Natural Areas at the Construction Site			
	16a-38k-6(e)(7)	Maximize Open Space			
	16a-38k-6(e)(8)	Implement a Stormwater Management Plan Reducing Run-off by 25%			
	16a-38k-6(e)(9)	Implement a Stormwater Management Plan that Treats 90% of Annual Rainfall			
	16a-38k-6(e)(10)	Reduce Heat Island Effect Through Landscaping Strategies			
X	16a-38k-6(e)(11)	Select Roofing Materials to Reduce Heat Island Effect			
X	16a-38k-6(e)(12)	Reduce Outdoor Light Pollution	ARCHITECT/ENGINEER	Lighting system design.	Electical Plans and Division 26 Specifications
	16a-38k-6(e)(13)	Orient Building for Daylighting and Energy Performance			
X	16a-38k-6(e)(14)	No Building in Floodplain and Sustainable Site Development			
X	16a-38k-6(e)(15)	Site Building away from External Sources of Excessive Noise			
		No minimum requirement for measures in subsection (f)			
X	16a-38k-6(f)(1)	Eliminate the use of CFCs, HCFCs and Halons	ARCHITECT/ENGINEER	Specification of non-depleting products.	Mechanical Plan 401 & Specification Section 236416
	16a-38k-6(f)(2)	Building Innovation			
	16a-38k-6(f)(3)	Curriculum on Sustainable Building Features			
30	**Total Building Standard Optional Strategies (28 Needed for Compliance)**				

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MEMORANDUM OF MEETING

PROJECT: Crystal Lake and Windermere Schools

CLIENT: Town of Ellington

MEETING PLACE: Board of Ed Office

DATE AND TIME: September 24, 2012 at 12:30 am

ATTENDEES:

Peter Williams	PBC
Bruce Brettschneider	Director Special Services
Stephen Cullinan	Superintendent of Schools
Steven Moccio	Principal-Windermere
Dan Kevine	BOE Chair
Erin McGuril	Director of ED Services
Maurice Blanchette	First Selectman
Gary Blanchette	BOE & PBC
Pete Welti	PBC
Michael Larkin	Principal-Crystal Lake
Meg Devlin	Dir. Of Business Services
Tracey Kiff-Judson	Board of Education

Purpose: Kick-off meeting

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1. Steve Cullen provided a brief introduction to the project and described the overall project goal with a brief explanation of the history of the project.
2. Steve Cullen will remain the gate-keeper and the main contact for all email distribution with in the board of education until further notice.
3. Steve described the scope of work for Windermere School to improve the following:
   - Reconfiguration for the pre-K level.
   - The need for expansion and modification of the restroom and lavatories to be associated with the integration of the 5th and 6th wing.

- The expansion of redesign of office space and more efficient meeting space.
- Renovation of the nurses office which currently is not within the add specifications.
- The expansion of the computer lab.

4. The group discussed some of the major concerns revolving around the design of site concerns regarding the risking of site line issues, related to traffic safety.
5. A review with the Department of Transportation is recommended early in the process to evaluate the site lines and location of the new curb cut.
6. An update of enrollment projections will be provided by NESDEC. It was noted that the butting property owner on south road has recently placed their property on the market. SP+A to provide an evaluation to the necessity of that property so that the Town can weight the possibility of entertaining an offer.
7. The church currently owns the adjacent parking lot and is within a mutual agreement with the Town to maintain and have an as of right use of that parcel. Review of this may trigger state traffic commission approval and or at least a determination form which will be required for submittal to the BSF.
8. SP+A has requested by Peter Williams will provide an action list of items that need to be provided by the Town and/or Building Committee/BOE.
9. Dean Petrucelli spent some time presenting designs that were prepared for the interview process. These designs were just thought driven and were not influenced by any interviews or directions from the educators and the intent of the presentation was just to spark discussion on the direction of schematics.
10. It was felt by all that we should investigate and re-evaluate the program in some degree but a majority of the designs and decisions made to the Moser Pillon feasibility study will remain intact unless other options could be reconsidered.

Next meeting is to be determined. The building committee meeting is scheduled for October 11 and the board of education meeting is scheduled for October 24. It will be determined to what extent SP+A will be making presentations or providing any information for that upcoming meeting.

Any corrections, additions, or comments should be made to Silver / Petrucelli + Associates within 14 days of the date of the meeting.

Distribution: file

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MEMORANDUM OF MEETING

PROJECT: Crystal Lake and Windermere Schools

CLIENT: Town of Ellington

MEETING PLACE: Crystal Lake School

DATE AND TIME: October 10, 2012 at 4:00 pm

ATTENDEES:

Stephen Cullinan	Superintendent of Schools
Michael Larkin	Principal-Crystal Lake
Amanda Cleveland	SP+A
Dean Petrucelli	SP+A

Purpose: Confirm Program and Adjacencies

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1 REVIEW OF SPACE PROGRAM

- Move school Psych. Office to Administration Suite or directly adjacent.
- Running water in necessary in Staff Dining; separate space from Staff Work room. Adjacency of these two spaces is not required.
- 4 lunch waves will be utilized after addition. Future potential for full day kindergarten should be considered.
- Provide access to additional duplex outlets in all classrooms spaces
- Provide 2nd office for Social Worker/Guidance @ approx. 100 s.f.
- Nurse should be adjacent to front door & Main Entrance for emergency access.
- Due to the increase in population, assistance & future meetings with media specialists will be required w/size requirements, programs, number of books, etc.
- Voter equipment is delivered to School when needed and not stored. Therefore, no storage for equipment is required.
- Emergency Shelter storage of cots should be considered if possible. High school has been used in the past with only water being available. Lower on priority list is a generator for emergency shelter needs. This will be analyzed against the current budget.

- Pre-K at Center school will move to Windermere at the completion of the renovations/additions. A total of 4 classrooms will be moving over.
- Windermere School has increased by 100 children over a 4 year period. House Rentals with children getting into district is making it more difficult to predict future student population.
- Difficult to run PE + Music at same time in current location due to poor acoustic separation. Don't need to lower stage floor unless it captures significantly more s.f. for room. The Stage function is not required in the future as this space is no longer utilized.
- A separate Kiln Room in the Art Room is required. Currently need to go other schools to fire all pottery projects.
- It is preferred to have Science adjacent/ closer to upper grades; used by grades 3-6
- O.T. assigned to Crystal lake School one day per week; doesn't need separate/private office, can be part of OT/PT room.
- Speech is larger than it needs to be and can be reduced to 150 s.f.. This space needs to accommodate up to 4 students at a time at a round table.
- There should be (2) Reading intervention spaces at 200 s.f. each and capable of sitting up to 4 students at a time. Also needs a computer space for computer program.
- Currently some areas of Crystal Lake are wireless. If the Design Team feels that wireless is the right technology, then Crystal should head in that direction.
- Currently (2) outdoor storage sheds meet their current needs; may need one more max. Indoor storage can always be used and the Design team should look for all available opportunities.

2. REVIEW OF SCHEMATIC OPTIONS

- SP&A presented 5 different floor plans & site plans, (scheme 1, 1A, 2, 3 &4) each with variations of program placements, options, adjacencies, etc. SP&A feels that the original M/P plan could be improved upon including grade clustering, centralizing the media center, utilizing less fill to accommodate floor elevations, etc.
- S. Cullinan expressed a concern with the fact that some of the schemes did not have provisions for a future expansion and that the M/P design had a corridor for future addition. (*SPA does not feel designing the current addition based on a potential future additions was the right solution. The site offers more than enough space to provide future additions when necessary to accommodate future growth. SP&A feels that it is near impossible to predict today what your future growth will require, if any.)*
- S. Cullinan & M. Larkin do not see any hardship with providing an additional interior ramp vs. 1 floor level as proposed by MP. SP&A stated that their initial calculations are showing a savings of 5000 C.Y. if an interior ramp is utilized in the proposed addition.
- Kitchen should have vehicular access for deliveries and refuse collection vehicles.
- Provisions for a separate bus drop-off & separate parent drop-off at separate entrances are required/preferred. There are currently (5) full length busses serving Crystal Lake, (1) ½ size bus & (1) van. S Cullinan expects an additional 3 or 4 busses will be needed after the additions/renovations.

- Existing parking count = 86 which is currently adequate for regular school day. There are currently 35 staff parking spaces and it is projected that 50 staff spaces will be required after the additions. M Larkin stated that there is approx. 15-16 parents waiting for pick up in the "worst case scenario" although he has never actually counted. All parties agreed that the proposed 96 parking spaces & 38 event parking spaces (doubling as the grades 1-5 hardscape) should be adequate for the new facility.
- Kitchen delivery times are not known, but M Larkin believes they happen before 7:30 am. Including the Thurston food truck. The milk delivery truck is sometimes arriving at the same time as the bus and parents, but this is a smaller truck – not as large as Thurston truck. Parking for fields for weekend activities is not a high priority but would likely be needed and encourage by the Parks & Rec. department.
- An ADA compliant walkway will be needed over the wetlands for student access connecting the school to the (3) remote fields.
- All of the fields will be used by Parks & Rec on the weekends.
  Field – closer to school – informal field (full size preferred)
  Fields East of wetlands – further away - more structured.
- Separate primary & upper hard and playscapes are desired as originally planned
- Hardscapes could double as event parking
- SP&A reported that the project does not require the purchase of the newly listed adjacent property along South Road.
- SP&A reported that the current schedule is anticipating 100% SD's by mid January 2013.

NEXT ACTION

Steve and Michael to review schemes 1-4 and narrow down the preferred schemes and provide comments and/or any changes desired. It was discussed that they will narrow down options prior to presenting to the Board & Building Committee.
SP+A commented that they are still awaiting as-built drawings of Windermere School.

Any corrections, additions, or comments should be made to Silver / Petrucelli + Associates within 14 days of the date of the meeting.

Distribution: all attendees, P. Welti, P Williams, D. Stein, K. Sgorbati, W Walters,
File

ELLINGTON BOARD OF EDUCATION
Ad Hoc Facilities Committee

November 20, 2012
Minutes

A regularly scheduled meeting of the Ellington Board of Education Ad Hoc Facilities Committee was held on Tuesday, November 20, 2012 in the School Administration Building. Committee Chairperson, Dan Keune, called the meeting to order at 3:00 p.m. Committee members present when the meeting was called to order were: Mr. Gary Blanchette, Mr. Dan Keune, Mr. Ronald Stomberg, and Mrs. Melinda Stimac. Administrators present were: Mr. Michael Larkin, Dr. Erin McGurk, Mr. Bruce Brettschneider, Mrs. Margaret Devlin and Mr. Stephen Cullinan. Also present were: Mr. Maurice Blanchette, First Selectman, Mr. Gary Magnuson, Vice-Chair Permanent Building Committee and Mr. Peter Williams, Owners Representative. Also in attendance were Dean Petrucelli of Silver/Petrucelli + Associates and Luke McCoy and Will Walter of BSC Group.

- Review of Silver/Petrucelli Floor Plan Schemes for Crystal Lake School

Mr. Petrucelli reviewed a revised one-story scheme based upon feedback from committee members and staff. The scheme was labeled as Scheme 3.2. The revised scheme addressed the following:

- Eliminated the angled wall and squared off the building
- Provides ten classrooms with a corridor that provides a "loop" of the building
- Moved offices for reading, speech, social worker, and school psychologist to perimeter to allow natural light
- Eliminated the recesses in the classroom doors
- Toilets in primary rooms located "back to back"
- Doors into primary classrooms positioned for better visibility into classrooms
- Media center walls squared off
- Lobby space scaled back
- Two new classrooms do get reduced natural light
- Courtyard is smaller
- Does not allow a visual connection to media center from lobby

Mr. Keune noted that if there were to be financial issues with this project the angled wall of the media center in Scheme 3.1 could be a lightning rod for discontent. He also noted that Mr. Petrucelli's e-mail of November 15, 2012 stated that Scheme 3.2 added 58 sq. ft. but created 450 more sq. ft. of usable space.

Mr. Williams stated that Scheme 3.2 produced a better lobby. Mr. Keune recommended a further adjustment to the lavatories in the kindergarten rooms. There was discussion of possibly adding interior doors to access the courtyard from existing classrooms. Mr. Petrucelli will get a cost estimate as an alternate for these doors.

Mr. G. Blanchette questioned the square footage of the existing rooms. Mr. Keune noted that the addition may cross over the existing water lines from the new well. Mr. Brettschneider expressed support for Scheme 3.2, in particular for the natural lighting into such rooms a speech and language. There was discussion of the need for storage for a variety of purposes.

A motion was made to recommend that schematic design be authorized for Scheme 3.2.

1st. M. Stimac 2nd. G. Blanchette

VOTE: Unanimous. The motion passed.

Mr. McCoy and Mr. Walter reviewed three variations of a site plan for Crystal Lake School with the advantages and disadvantages of each. Plan One provides:

- A grades 2-5 play area adjacent to their classrooms
- A separate bus and parent drop-off
- Two full U-10 soccer fields
- One high school sized field
- Little League baseball field

Issues noted with Plan One were:

- Distance from parking lot to school entry
- No drive entrance at ball fields
- Wetland buffer disturbance and retaining walls resulting from high school field

In addition to everything listed in Plan One, Plan Two provides:

- Bus drop-off for eight buses
- Access drive and parking for field usage

Issues noted with Plan Two were:

- Potential retaining wall for high school field
- Potential minor wetland disturbance for field
- Baseball field solar orientation

Plan Three provides:

- A grades 2-5 play area adjacent to their classrooms
- A separate bus and parent drop-off
- Bus drop-off for eight buses
- Access drive for field usage
- Three full U-10 soccer fields
- Little League baseball field

- Potential for overflow parking adjacent to fields

Plan Three would require additional fill for the entry plaza at the main entrance.

One positive note was that the new entrance in Plans Two and Three would not disturb the wetlands and would not require a special walkway over the wetlands to access the fields. There was consensus to eliminate Plan One. The separate bus and parent drop-off was noted as a priority. It was noted that vehicles may have limited ability to exit onto Route 140 and thus provision must be made for cars entering off Route 140 to exit onto South Road. The plan does not use the land which is the parking lot owned by the church. There was discussion of the appropriate location for the exit onto South Road so that headlights are not shining directly into homes and to minimize traffic issues at Route 140.

Mr. Keune noted the possible need for areas for water retention. There was support for the two separate play areas by grades. The bus drop-off closer to the building was preferred. It was noted that the proposed athletic fields will certainly benefit the town. Concern was expressed regarding not losing any reimbursement on the fields.

A motion to adjourn was made at 4:48 p.m.

1st. M. Stimac 2nd. G. Blanchette

VOTE: Unanimous. The motion passed.

Respectfully submitted,

Stephen C. Cullinan

ELLINGTON BOARD OF EDUCATION
Ad Hoc Facilities Committee

January 11, 2013
Minutes

A regularly scheduled meeting of the Ellington Board of Education Ad Hoc Facilities Committee was held on Friday, January 11, 2013 in the Administration Building. Committee Chairperson, Dan Keune, called the meeting to order at 3:05 p.m. Committee members present when the meeting was called to order were: Mr. Gary Blanchette and Mr. Dan Keune. Administrators present were: Mr. Michael Larkin, Dr. Erin McGurk, Mr. Bruce Brettschneider, Mrs. Margaret Devlin, Mr. Robert Butler and Mr. Stephen Cullinan. Also present were: Mr. Maurice Blanchette, First Selectman and Dean Petrucelli of Silver/Petrucelli + Associates.

- Review of Silver/Petrucelli Final Floor Plan Scheme for Crystal Lake School

Mr. Petrucelli reviewed the proposed final one-story floor plan scheme for Crystal Lake School which will be presented to the Permanent Building Committee on January 15, 2013. Mr. Petrucelli stated that the schematic design fits the program needs and the budget established for this project. His presentation to the Permanent Building Committee will include a narrative. TRC has completed the Hazmat testing. Geo-technical information has also been gathered.

Mr. Petrucelli reviewed the Space Program Template which compares existing space, baseline space needs and final needs based upon this schematic design. Mr. Petrucelli reviewed the various documents distributed to each member in attendance. Document A1 contains the Crystal Lake Existing Floor Plan. Document A2 is the Proposed Demolition Floor Plan. All asbestos will be removed in the project. There will also be some PCB removal. Hazardous material removal is anticipated to occur in the summer of 2014. Document A3 is the Proposed Floor Plan for Crystal Lake School which was based upon Scheme 3.2.

The next document provided a color-coded Proposed Phasing Floor Plan. It was noted that during Phase 1, art and music will need to share a space. Mr. Keune requested that the architect investigate what may have previously been done to provide a conduit for natural gas to Crystal Lake School. It was also recommended to inquire if Yankee Gas has any plans to extent the availability of natural gas to the Crystal Lake area, and if so, what that timeline might be. A request was also made to look at the phasing to see if moving students for only one year to Windermere School could be avoided.

Documents A6, A7 and A8 were related to Proposed Elevations. There were seven documents with renderings of Crystal Lake from various locations. The base of the new building will be brick with insulated metal panels on the upper half. There was considerable discussion regarding possible security measures.

A Schematic Site Rendering was also presented. The sewer connection will work by gravity. There was a reminder to avoid bus lights shining into the home located on South Road. There is no connection between the school project and the church parking lot. Mr. Blanchette will meet

with church officials on this topic. Mr. Cullinan offered to attend any meetings with church officials. There was discussion of separating bus and parent traffic. The site can accommodate two U-10 fields within a regulation high school field, along with an overlapping baseball field. In addition, a U-10 size field can be located near the school for physical education and recess activities.

There will a 15,000 gallon underground tank to support the sprinkler system that is required by code. Mr. Blanchette inquired as to storage for shelter purposes. Space for storage is limited and due consideration will be given to this need.

Upon completion of this review it was recommended that the Proposed Final Floor Plan Scheme for Crystal Lake School be presented to the Permanent Building Committee on January 15, 2013.

The meeting adjourned at 4:50 p.m.

TRC
Results you can rely on

HAZARDOUS MATERIAL SURVEY
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Prepared for

Ellington Building Committee
Ellington, Connecticut

Prepared by

TRC Environmental Corporation
Windsor, Connecticut

Robert Romejko
Program Manager

Steve Arienti
Co Program Manager

January 10, 2013

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DRAWINGS

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) of Windsor, Connecticut, was retained by the Ellington Permanent Building Committee (PBC) to perform a hazardous material survey of the Crystal Lake School located in Ellington, Connecticut. This report serves to provide the PBC with detailed information concerning the location, condition and overall assessment of the hazardous material identified at the site, as well as to provide guidance recommendations as to the proper course of action in dealing with noted hazardous material prior to any renovation project.

Prior to conducting the inspection, TRC reviewed Crystal Lake School's Asbestos Management Plan, asbestos abatement compliance reports, and building construction plans. TRC then met with the renovation projects architect, Silver Petrocelli and Town of Ellington officials. The Architect identified the areas of the school scheduled for renovation and which caulks are to be disturbed.

The hazardous material survey was conducted by a State of Connecticut licensed inspector as a walk-through visual inspection combined with the collection of bulk samples from all accessible suspect hazardous material. The suspect hazardous material was sampled and analyzed in accordance with current United States Environmental Protection Agency (U.S. EPA) guidelines. Bulk samples were collected from homogenous materials within defined functional areas.

All asbestos bulk samples were transferred utilizing proper chain-of-custody procedures to the TRC laboratory in Windsor, Connecticut for analysis by Polarized Light Microscopy with dispersion staining (PLM/ds) methods and/or to ProScience Analytical Services, Inc. in Woburn, Massachusetts for Transmission Electron Microscopy (TEM) methods. Both laboratories are approved to perform analysis by the State of Connecticut Department of Public Health (CTDPH) and are active participants in the National Institute for Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP).

Radon samples were analyzed by TRC's National Environmental Health Association (NEHA) and National Environmental Health Association (NRPP) certified Analytical Laboratory (#102266AL) in Windsor for analysis utilizing a gamma scintillation spectroscopy system.

All mercury samples were transferred with similar chain-of-custody forms to Phoenix Laboratories located in Manchester, Connecticut for analysis. Phoenix is approved by the State of Connecticut to perform such analysis.

All PCB bulk samples were also transferred to Phoenix Laboratories and Spectrum Analytical. The Environmental Protection Agency (EPA) Methods 8082/3540C (PCB analysis with soxhlet extraction) was used for analysis.

2.0 SITE HISTORY AND DESCRIPTION

Crystal Lake School consists of an original 11,350 SF one story brick building that was constructed in 1955. In 1977 a 18,250 SF one-story addition was built onto the west end of the school. Construction is primarily cmu walls on a concrete slab with structural steel and a metal deck in the'77 wing and wood framing and plaster walls in the '55 wing. A cafeteria and kitchen are located in the northeast corner of the 1955 building with a sloped shingled roof over it. A flat built up roof covers the remainder of the '55 wing which houses classrooms. Suspended ceiling tiles and floor tiles are located in this wing. Typically there are windows in the classroom doors and two windows on the wall between a classroom and the hallway for borrowed light. Access to a mechanical room above the ceiling of the '55 wing can be gained by ladder located in a store room next to the girls lavatory. Beneath the front of this wing are an incinerator room (now used for storage) and a boiler room which houses two boilers. Hot water is feed through tunnels to heating units which traverse the perimeter of the '55 wing. All friable accessible asbestos was abated from the boiler room, tunnels and above suspended ceilings in the '55 hallway in 1990. A rolled roofing system was installed over the flat portion of the roof in 2002. BOE personnel indicate that there are many layers of built-up roofing under the rolled roofing.

The office area near the front entrance marks the beginning of the 1977 wing. Classrooms are covered with carpet and in most areas the cmu walls are unpainted. There is a mechanical room which forces hot air throughout the '77 wing. Fiberglass insulation can be found on piping along with mudded fittings (not covered with pcv jackets). In most of the '77 wing there are fixed ceilings (sheetrock) above which the ductwork and piping run. A large gym is situated in the southwest corner of this wing. Because the gym is covered with a gabled roof, there are no roof drains evident at ceiling height. There is a large chase that runs the length of the gym which houses ductwork and which leads to an auxiliary heater unit above a stage on one end of the gym. The gabled roof extends beyond the gym and covers two (2) large classrooms which have very high ceilings.

There is an underground storage tank in the front of the school and a septic tank and field in the rear of the school. Also located on the east side are two outbuildings of newer construction which are used for storage and are not a part of the renovation process.

3.0 ASBESTOS SURVEY

3.1 Observations and Findings

Inspections for asbestos have occurred in this school since the 1980s. Asbestos has been found; both friable (easily pulverized by hand pressure) and non-friable (tightly bound). TRC has reviewed existing documentation and interviewed school personnel as to building conditions and recollections of abatement. The most recent inspections were performed by TRC's Robert Romejko, Steve Arienti and Greg Kaczynski, Connecticut licensed asbestos inspectors in December, 2012.

During the asbestos survey, both friable and non-friable suspect ACM were visually identified and sampled according to current AHERA guidelines. The intent of this survey was to identify any ACM which was not included in previous investigative surveys and to incorporate all findings and sampling in one report. The following forms of suspect materials were identified and assumed or sampled accordingly: boiler insulation, boiler breeching insulation, mudded pipe fittings, pipe seam sealant, carpet mastic, 12" x 12" floor tiles and associated mastic, 9" x 9" floor tiles and associated mastic, levelastic, cove base and associated mastic, sheetrock/joint compound, ceiling tiles, window glazing putty, window/door caulk, sink insulation, firedoor insulation, internal boiler insulation, incinerator firebrick, light fixture paper insulation, flexible duct connectors, ceiling paint, plaster, firebrick, built –up roofing (top layer only), roof flashing, roof vapor barrier, asphalt shingles, asphalt roll on, transite shingles, mastic holding blackboards, glue daubs under ceiling tiles, glue daubs behind mirrors, glue daubs behind square tectum wall blocks, glue behind panels, mastic under gym floor and vapor barrier under stage flooring.

TRC collected bulk samples of the suspect ACM referenced above and transferred the samples to the TRC laboratory for PLM/ds analysis. As recommended by the U.S. EPA, all non-friable, organically bound material such as floor covering materials, which were found to contain less than 1% asbestos by PLM methods of analysis, were transported to ProScience Analytical Services, Inc. for analysis by TEM methods. TEM analysis utilizes a higher degree of magnification and consequently produces fewer negative results and provides more accurate asbestos quantification than PLM/ds analysis. Results of the laboratory analysis indicate that of the homogenous materials sampled, **the following were found to contain asbestos in quantities greater than 1% by weight: floor tile and associated mastic, pipe insulation, mudded fittings, internal boiler insulation (assumed), window glazing putty, window caulk, door caulk, joint caulk ('77 wing), blackboard glue, black tar flashing on perimeter (roof 4), built-up tar roofing (top layer**

only)(roof 4), black/silver tar flashing on perimeter (roof 6), flashing tar on top of parapet (roof 5), penetration flashing tar (roof 5), window caulk (55' wing, west side), window glazing putty ('77 wing) and transite shingle (roof 6). (Note: Because of the inclement weather conditions, core samples of the roof were not taken. TRC will work with the Architect and provide sampling when the Architect performs roof cuts during warmer weather. Based on past experience more roofing than noted will test positive. For cost estimating purpose, TRC will assume the whole built-up-roof to contain asbestos.) A summary of all bulk samples collected for this project including location descriptions and results of the respective laboratory analysis is contained in **Table 3-1**. A summary of those materials identified as ACM is included in **Table 3-2**. A summary of those materials found to be non-asbestos is included in **Table 3-3**. For those materials sampled, refer to **Appendix A** for chain-of-custody records which document the transfer of bulk asbestos samples from the Crystal Lake School in Ellington, Connecticut to the TRC laboratory in Windsor, Connecticut and the PLM/ds analytical results.

Refer to **Appendix B** for copies of the chain-of-custody reports that document the transfer of bulk samples from TRC's laboratory in Windsor, Connecticut to ProScience laboratory in Woburn, Massachusetts and TEM confirmatory sample analysis results.

The current NESHAP regulations require that regulated asbestos-containing material (RACM) be removed from a facility being renovated or demolished prior to any activity begins that would break-up, dislodge, or similarly disturb the material or preclude the access to the material for subsequent removal. The NESHAP regulations define a RACM as *"a) friable asbestos-material, b) Category I non-friable ACM that has become friable, Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or c) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized or reduced to powder by forces expected to act on the material in the course of demolition or renovation operations..."*. Using this definition and the data collected from this survey, TRC recommends that a proper asbestos abatement plan which addresses the impact of the future renovation plans for the subject property be created in order to minimize the disturbance of the identified ACM.

It is the responsibility of the building owner or the operator of the demolition/renovation activity to comply with all applicable requirements of the federal NESHAP regulation section 61.145 prior to any demolition and/or renovation activity. This report meets the requirements of NESHAP Section 61.145 (a) and can be used for the notification requirements of Section 61.145(b).

4.0 LEAD PAINT SURVEY

4.1 Observations and Findings

In December of 2012, TRC representative Michael Kostruba performed a survey of the Crystal lake School. The purpose of the lead based paint (LBP) investigation was to determine if the United States Department of Labor (US DOL) Occupational Safety and Health Administration (OSHA) Lead Exposure in Construction Standard (29 CFR 1926.62), EPA Hazardous Waste Disposal Regulations (40 CFR Parts 260 through 271), and/or CT Hazardous Waste Management Regulations (22a-209-1; 22a-209-8(c); 22a-449(c)-11 and 22a-449(c)-100 through 110) will apply to the proposed renovation activities. In addition, new EPA regulations went into effect in September of 2010. The new regulations will require the contractors working at the site to have additional training (8 hours as compared to the present 2 hour training required by OSHA) and will require clearance testing after work is completed.

The method used for the LBP investigation by TRC was X-Ray Fluorescence (XRF) utilizing the NITON XL309 L & K shell Spectrum Analyzer. The NITON XL detector is a portable unit that is designed to make fast, accurate, non-destructive measurements of lead concentrations in dry painted surfaces. The NITON XL detector displays lead concentration levels in milligrams per square centimeter (mg/cm^2) and as a spectrum analyzer needs no adjustment for substrate correction. The minimum detection level of lead paint using the NITON XL is 0.01 mg/cm^2. The EPA/US Department of Housing and Urban Development (HUD) lists the following classifications for categorizing XRF measurements from the NITON XL Spectrum Analyzer in the August 24, 1995 edition of the NITON XL Performance Characteristics Sheet (PCS). When taking a measurement:

1. Measurements equal to or greater than 1.0 mg/cm^2 = toxic
2. Measurements less than 1.0 mg/cm^2 = non-toxic, low levels

The EPA/HUD classification system was devised for assessing risk under childhood lead poisoning prevention control regulations. The OSHA lead exposure in construction standards, however, do not distinguish between toxic and non-toxic levels of lead. Therefore, all XRF measurements at or above the detection level contain some applicable level of lead. For XRF measurements below the detection limit, a third classification is as follows:

3. Measurements less than 0.01 mg/cm^2 = below detectable limits (BDL)

TRC has classified each XRF measurement into one of the three categories above. A total of 351 representative measurements were taken utilizing the NITON XL, of which 28 were used to calibrate the instrument. Results of the remaining painted surface measurements indicated that 179 of the measurements had readings below detectable limits (BDL)(0), indicating no detectable lead present. **However, toxic levels of lead were observed in the '55 wing on the following:**

1. **In the lavatories of Rooms 3, 5, 7 and 9, the ceramic wall base.**
2. **In the boys and girls lavatories, the ceramic wall base.**
3. **The door casing, jamb and stop at the south entryway (end of hallway).**
4. **The Boiler Room and Incinerator Room metal door jambs, casings and stops.**
5. **On the metal railing in the stairwell leading to the Boiler Room and on the metal railing in the Boiler Room.**
6. **On the I-beams above the ceiling in the hallway just outside the cafeteria.**
7. **At the exterior doorways in Rooms 3, 5, 7 and 9, the small wooden alcove ceiling, trim work, soffit, wooden door casings and wooden doors.**
8. **At the exterior doorways to the kitchen and adjacent storage shed, the wooden door casings, doors and soffit.**
9. **On the exterior 3 pane window casings and sills adjacent to the cafeteria.**
10. **On the exterior wooden window and door casings of the cafeteria.**
11. **On the exterior roof level soffit and header that runs around the perimeter of the wing.**
12. **On the soffit of the roof over the cafeteria.**
13. **On the exterior wooden window casings on the east side.**
14. **On the exterior soffits of the overhang at the front entrances to the school.**

No toxic lead was found in the '77 wing.

The remaining readings showed low levels of lead paint. A summary of the XRF measurements are attached. **Any construction/renovation/demolition activity which would impact the lead (toxic and non-toxic) must be conducted in in compliance with the OSHA lead in construction standard 29 CFR 1926.62. Based upon the fact that the new kindergarten will be located in the newly constructed wing and any facilities that these young students would need to use would be in the present '77 wing (lead free), the new EPA lead rule would not apply.** OSHA requires that the Contractor must demonstrate that employees are not exposed to lead

while performing work on the materials listed above. This is accomplished by running an exposure assessment. All of the requirements can be better understood by reading the CT, OSHA and EPA Regulations and attending courses offered by Environmental firms.

Based on the XRF readings obtained by TRC, metallic material can be send to a recycling firm. However, window and door components and other toxic building materials, if demolished, should be isolated and disposed of as hazardous waste. Periodic TCLP sampling of waste loads should be made to ensure that debris can leave the site as non-hazardous.

5.0 RADON SURVEY

5.1 Observations and Findings

As recommended by the CT DPH Radon Group for re-evaluation, air testing was conducted in 10% of all frequently occupied rooms in contact with the ground, under "closed building conditions", during the weekday period of the colder months of the year, and with the HVAC systems operating normally. Testing was conducted using short-term (2-day), 4" open faced, activated charcoal (AC) adsorption canisters in accordance with the USEPA guidance documents *Radon Measurement in Schools, July 1993* and *Indoor Radon and Radon Decay Product Measurement Device Protocols, July 1992*. Sample collection, placement and retrieval were conducted under the direction of TRC personnel certified by the NEHA and NRPP as Residential Measurement Providers (RMP) (#102265RT).

Analysis of the AC canisters revealed no air test with a radon concentration above the USEPA Action Level of 4.0 pCi/L.

Even though the radon samples were clean, a radon mitigation system is required to be installed under the new addition to the building as per Connecticut's Indoor Air Quality Act as monitored by the CT School Facilities Unit.

6.0 MERCURY SURVEY

6.1 Observations and Findings

Rubber floors as found in the gymnasium typically contain mercury. During fabrication of this flooring material, mercury is added to act as a fungicide. Samples of the floor material were taken and analyzed at Phoenix Laboratories. Results indicated that 481 ppm mercury is present in the rubber. A TCLP sample of the same material passed. However, the rubber flooring material must be disposed of properly in a landfill sanctioned to take mercury waste.

7.0 REGULATED ITEMS SURVEY

7.1 Observations and Findings

OSHA, USEPA RCRA, USEPA TSCA, CTDPH and CTDEEP standards call for the management, removal, handling, packing, labeling, transport, recycling and/or disposal of various items with hazardous/regulated material/waste constituents. TRC inspected the school for "regulated items" and found the following to be present with estimated quantities. **Note: Items such as computers, phones, miscellaneous paints, chemicals, cleaners etc were not inventoried as these items may be used for future use and/or removed by the school prior to the renovation.** Potential hazards of the items are in parentheses:

- Fluorescent light bulbs (Hg) – 780
- Fluorescent light ballasts (PCBs/DEHP/Electronic) – 390
- Flood/Emergency Lights (Batteries/Hg/Circuit boards) – 32
- Fire alarm strobe (Low level radioactive source/Hg/Circuit boards) – 20
- Fire alarm pull boxes (Hg/Circuit boards) – 15
- Exit signs (Hg/Circuit boards) – 19
- Smoke/fire detectors (Low level radioactive source/Circuit boards) – 24
- Motion/Cooper sensors (Circuit boards) – 23
- Multimedia/network outlets (Circuit boards) – 28
- Hearing impaired devices (Circuit Boards) – 9
- Security/fire/ various types of control panels/boxes (Batteries/Circuit boards) – 44
- Lead acid batteries (Batteries) – 2
- Water fountains (Refrigerants) – 5
- Refrigerators/Freezers (Refrigerants) – 4
- HVACs units (Refrigerants) – 4
- Air conditioner (Refrigerants) – 3
- Fire extinguishers (Waste chemical solid) – 14
- Fire suppression system (Waste chemical solid) – 1
- Underground storage tank (Oil) – 1

8.0 PCB SURVEY

8.1 Observations and Findings

Initial building surveys and sampling were performed in December, 2012 to categorize interior and exterior caulks and glazing putties at Crystal Lake School. Analytical data reports for all sampling are included in Appendix F.

All of the caulk and glazing putty (bulk product) analytical results are presented in Table 8-1. Figure PCB-1 show the locations for PCB Bulk Product Waste as well as State Regulated Materials.

8.2 Bulk Product and Building Material Sampling and Results

On December 12, 2012, TRC surveyed the Crystal Lake School and collected forty-two (42) caulk and glazing putty samples. Sampling methodology involved collecting a single grab sample per homogenous material type identified by completely removing the caulk and the glazing putty from the location and inspecting to determine if there were any other materials present at that location. As no evidence of re-caulking or replacement was observed, all of the caulks and glazing putties were determined to be original to construction.

Building surveys were performed following techniques generally employed in the Building Sciences industry to identify, locate and sample homogeneous building materials (i.e. Asbestos Hazard Emergency Response Act [AHERA] asbestos sampling guidelines).

Based on the laboratory analytical results for the Bulk PCB Product Waste samples, building materials were grouped into one of three categories as described in the sections which follow.

8.2.1 PCB Bulk Product Waste

All caulk and glazing putty samples with total PCB concentrations ≥50 mg/kg were included in this category and zero interior & exterior caulk/glaze samples met the PCB Bulk Product Waste criteria. **Note: There are three exterior/interior caulks that are assumed to be PCB Bulk Product Waste (>50 mg/kg). The exterior light grey expansion joint caulk around the Gymnasium of the 1977 Wing, exterior light grey door caulk around the Gymnasium of the 1977 Wing and interior brown expansion joint caulk of the 1977 Wing (hallways/classroom walls & around I-beams). See drawing PCB-1 for areas where these materials could be potential impacted. Also, any non-porous/porous materials in contact with these three materials would need to be treated as >50 mg/kg PCB Bulk Product Waste as well when being removed and disposed of.**

8.2.2 Excluded PCB Products

Building caulks and glazing putty were determined to be Excluded PCB Products if the in-situ total PCB concentration was <50 mg/kg and if it could be determined that the caulk was original and that the total PCB concentration had not been modified by subsequent activities. As discussed above, all of the exterior building caulks were determined to be original to building construction and there was no evidence that subsequent renovations had modified total PCB concentrations. Thus, out of the forty seven (47) building caulks and glazing putties sampled, 47 were determined to be Excluded PCB Products.

Of the 47 Excluded PCB Products, forty six (46) sample results did not exceed 1 mg/kg, (46 samples being non-detectable, ND). These bulk materials are not considered to be a state-regulated material and will not be discussed further. The remaining one (1) sample was above 1 but below 50 mg/kg and is classified as state-regulated material and is discussed below. **Note: All caulks associated with the roofs are considered Excluded PCB Products since the roof was replaced in 2001 and the use of PCBs in building materials was banned in 1979.**

8.2.3 State Regulated PCB Products

Caulks and glazing putty with total PCB concentrations >1 mg/kg and <50 mg/kg are regulated by the State of Connecticut. Of the 47 caulks and glazing putties sampled, one (1) was determined to be state-regulated materials. The total PCB concentration detected in sample WG1C was determined to be 5.3 mg/kg and was collected from an interior window glazing putty in the hallway of the 55 Wing (see Figure PCB-1). Observations made during sampling indicate that this glazing was original and had not been modified by subsequent activities.

TABLES

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
01-5189	2' x 4' ceiling tile	Main hallway of old wing by kitchen storage – 1955 wing	0%	TRC/1989
02-5189	2' x 4' ceiling tile	Main hallway of old wing by Room 5 – 1955 wing	0%	TRC/1989
03-5189	2' x 4' ceiling tile	Main hallway of old wing by Room 8 - 1955 wing	0%	TRC/1989
04-5189	2' x 4' ceiling tile	Unit Room #3 - 1977 wing	0%	TRC/1989
05-5189	2' x 4' ceiling tile	Main hallway of 1977 wing by General Office	0%	TRC/1989
06-5189	2' x 4' ceiling tile 1977 wing	Unit Room #1 - 1977 wing	0%	TRC/1989
07-5189	Sheetrock	Exterior wall of teachers room by cafeteria- 1977 wing	0%	TRC/1989
08-5189	Sheetrock	Unit Room #3- 1977 wing	0%	TRC/1989
09-5189	Sheetrock	AV Room- 1977 wing	0%	TRC/1989
10-5189	Mudded pipe fittings	Hallway of new wing by General Office- 1977 wing	0%	TRC/1989
11-5189	Mudded pipe fittings	Hallway of new wing by General Office- 1977 wing	0%	TRC/1989
12-5189	Mudded pipe fittings	Above hot water tank in storage room by Unit Room #2- 1977 wing	0%	TRC/1989
13-5189	Spray-applied acoustical treatment	Hallway of new wing by General Office- 1977 wing	0%	TRC/1989
14-5189	Spray-applied acoustical treatment	Hallway of new wing by main entrance- 1977 wing	0%	TRC/1989

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
15-5189	Spray-applied acoustical treatment	Hallway of new wing by Girl's Locker room- 1977 wing	0%	TRC/1989
16-5189	Spray-applied acoustical treatment	Hallway of new wing by Boy's Locker room- 1977 wing	0%	TRC/1989
17-5189	Spray-applied acoustical treatment	Bathroom in Boy's Locker Room- 1977 wing	0%	TRC/1989
18-5189	Spray-applied acoustical treatment	Hallway of new wing by Unit Room # 2- 1977 wing	0%	TRC/1989
19-5189	Spray-applied acoustical treatment	Hallway of new wing by Grade #1 Room # 1- 1977 wing	0%	TRC/1989
20-5189	Hard plaster	Room # 9 – 1955 wing	0%	TRC/1989
21-5189	Hard plaster	Room # 7– 1955 wing	0%	TRC/1989
22-5189	Hard plaster	Room # 10– 1955 wing	0%	TRC/1989
23-5189	Hard plaster	Room # 6– 1955 wing	0%	TRC/1989
24-5189	Hard plaster	Room # 5– 1955 wing	0%	TRC/1989
25-5189	Hard plaster	Cafeteria	0%	TRC/1989
26-5189	Hard plaster	Custodial closet across from kitchen storage	0%	TRC/1989
01-BI	Boiler insulation	Boiler Rm top front boiler #1	ND<1%	TRC/2012
02-BI	Boiler insulation	Boiler Rm front right boiler #1	ND<1%	TRC/2012
03-BI	Boiler insulation	Boiler Rm rear boiler #1	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
04-BRI	Boiler breeching insulation	Boiler Rm rear boiler #1	ND<1%	TRC/2012
05-BRI	Boiler breeching insulation	Boiler Rm rear boiler #2	ND<1%	TRC/2012
06-BRI	Boiler breeching insulation	Boiler Rm rear boiler #2	ND<1%	TRC/2012
07-MAS	Mastic under black 9" x 9" floor tile	Room 8 perimeter	13.29% chrysotile*	TRC/2012
08-FT1	Black 9" x 9" floor tile	Room 8 perimeter	5% chrysotile	TRC/2012
09-MAS	Mastic under grey 9" x 9" floor tile	Kitchen	4.75% chrysotile*	TRC/2012
10-FT2	Grey 9" x 9" floor tile	Kitchen	5% chrysotile	TRC/2012
11-MAS	Mastic under grey 9" x 9" floor tile	Store Room by freezer	7.24% chrysotile*	TRC/2012
12-FT3	Dark grey 9" x 9" floor tile	Store Room by freezer	10% chrysotile	TRC/2012
13-MAS	Mastic under cove base	Café- south side	ND<1%*	TRC/2012
14-CB	Black cove base	Café- south side	ND<1%	TRC/2012
15-PLA	Plaster brown coat	Café- south side	ND<1%	TRC/2012
16-PLA	Plaster white coat	Café- south side	ND<1%	TRC/2012
17-MAS	Mastic under 12" x 12" blue floor tile	'77 wing south foyer	10% chrysotile	TRC/2012
18-FT4	12" x 12" blue floor tile	'77 wing south foyer	TR*	TRC/2012
19-MAS	Mastic under gym floor	Gym west side	ND<1%*	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
20-FC	Flexible duct connector	'77 wing mechanical room	ND<1%	TRC/2012
21-CT1	2' x 4' ceiling tile wormy	Custodian closet above hot water heater	ND<1%	TRC/2012
22-CT2	2' x 4' ceiling tile wormy	Boys locker room	ND<1%	TRC/2012
23-MF	Mudded fitting – heat pipe	Boys locker room above ceiling	ND<1%	TRC/2012
24-WC1	Window caulk	Café – NE corner next to brick	TR*	TRC/2012
25-WC1	Window caulk	Café – NE corner next to wood	TR*	TRC/2012
26-WGP1	Window glazing putty	Café – NE corner	ND<1%	TRC/2012
27-WC1	Window caulk	Room 3 – ext- south side	ND<1%	TRC/2012
28-DC1	Door caulk	Room 9 – ext- south side	3% chrysotile	TRC/2012
29-WC2	Window caulk	Room 4 – ext- north side south set	7.68% anthophyllite*	TRC/2012
30-PLA	Plaster brown coat	Room 6 - closet	ND<1%	TRC/2012
31-PLA	Plaster white coat	Room 6 - closet	ND<1%	TRC/2012
32-PLA	Plaster brown coat	Room 6 – west wall floor level	ND<1%	TRC/2012
33-PLA	Plaster white coat	Room 6 – west wall floor level	ND<1%	TRC/2012
34-CBM	Cove base mastic	Room 6 – west wall floor level	ND<1%	TRC/2012
35-SI	Sink anti-condensate	Room 5 – sink	ND<1%	TRC/2012
36-PLA	Plaster brown coat	Room 5 – by door to exterior	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
37-PLA	Plaster white coat	Room 5 – by door to exterior	ND<1%	TRC/2012
38-PLA	Plaster white coat	Stairwell to boiler room	ND<1%	TRC/2012
39-MAS	Mastic under 9" x 9" floor tile	Supply room next to teacher's rm	1.61% chrysotile*	TRC/2012
40-FT	9" x 9" light brown floor tile	Supply room next to teacher's rm	10% chrysotile	TRC/2012
41-CT	2' x 2' ceiling tile wormy	Hallway near cafe	ND<1%	TRC/2012
42-CT	2' x 2' ceiling tile more dots whiter - replacement	Hallway near cafe	ND<1%	TRC/2012
43-TP	Textured ceiling paint	'77 wing – hallway at bottom of ramp west of office	ND<1%	TRC/2012
44-CT	2' x 4' ceiling tile – wormy - new	'55 wing – hallway near boys lav	ND<1%	TRC/2012
45-RM	Rug mastic - orange	'77 wing – NW room – front door	ND<1%*	TRC/2012
46-RM	Rug mastic - orange	'77 wing – room next to NW room – front door	ND<1%	TRC/2012
47-RM	Rug mastic - orange	'77 wing - reading room –door to exterior	ND<1%	TRC/2012
48-LEV	Levelastic - spot	'77 wing – - reading room –door to exterior	ND<1%	TRC/2012
49-RM	Rug mastic - orange	'77 wing – rear room	ND<1%	TRC/2012
50-CT	2' x 4' ceiling tile - sheetrock	'55 wing - cafe	ND<1%	TRC/2012
51-CT	2' x 4' ceiling tile - sheetrock	'55 wing - cafe	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
52-CT	2' x 4' ceiling tile - sheetrock	'55 wing - cafe	ND<1%	TRC/2012
53-CT	2' x 4' ceiling tile - pinhole	'55 wing - kitchen	ND<1%	TRC/2012
54-CT	2' x 4' ceiling tile - pinhole	'55 wing - kitchen	ND<1%	TRC/2012
55-CT	2' x 4' ceiling tile - pinhole	'55 wing - kitchen	ND<1%	TRC/2012
56-SR	Sheetrock	'55 wing - cafe	ND<1%	TRC/2012
57-JC	Joint compound	'55 wing - cafe	ND<1%	TRC/2012
58-SR	Sheetrock	'55 wing - cafe	ND<1%	TRC/2012
59-JC	Joint compound	'55 wing - cafe	ND<1%	TRC/2012
60-SR	Sheetrock	'55 wing - cafe	ND<1%	TRC/2012
61-JC	Joint compound	'55 wing - cafe	ND<1%	TRC/2012
62-MAS	Mastic under black 12" x 12" floor tile	Electrical vault	10% chrysotile	TRC/2012
63-FT	12" x 12" black floor tile	Electrical vault	ND<1%	TRC/2012
64-MAS	Mastic under lt blue 12" x 12" floor tile	'55 wing – custodians room	TR*	TRC/2012
65-FT	12" x 12" lt blue floor tile	'55 wing – custodians room	17.13% chrysotile*	TRC/2012
66-MF	Mudded fitting	'77 wing – hallway by office	ND<1%	TRC/2012
67- PLA	Plaster – brown coat	'55 wing – boys lav	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
68-PLA	Plaster – white coat	'55 wing – boys lav	ND<1%	TRC/2012
69- SR	Sheetrock	'77 wing – hallway- bottom of slope	ND<1%	TRC/2012
70-JC	Joint compound	'77 wing – hallway- bottom of slope	ND<1%	TRC/2012
71	FL1-black flashing tar on perimeter & on penetrations where there is metal silver flashing materials	Roof 3	ND<1%*	TRC/2012
72	FL1-black flashing tar on perimeter & on penetrations where there is metal silver flashing materials	Roof 3	ND<1%	TRC/2012
73	FL1-black flashing tar on perimeter & on penetrations where there is metal silver flashing materials	Roof 3	ND<1%	TRC/2012
74	FL2-black perimeter flashing tar on perimeter (on metal)	Roof 3	ND<1%*	TRC/2012
75	FL2-black perimeter flashing tar on perimeter (on metal)	Roof 3	ND<1%	TRC/2012
76	FL2-black perimeter flashing tar on perimeter (on metal)	Roof 3	ND<1%	TRC/2012
77	FL3-silver/black flashing tar on perimeter nails	Roof 3	ND<1%*	TRC/2012
78	FL3-silver/black flashing tar on perimeter nails	Roof 3	ND<1%	TRC/2012
79	FL3-silver/black flashing tar on perimeter nails	Roof 3	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
80	FL4-black tar flashing on perimeter	Roof 4	3% chrysotile	TRC/2012
81	FL4-black tar flashing on perimeter	Roof 4	NA/PS	TRC/2012
82	FL4-black tar flashing on perimeter	Roof 4	NA/PS	TRC/2012
83	FL5-black/silver perimeter flashing tar	Roof 6	20% chrysotile	TRC/2012
84	FL5-black/silver perimeter flashing tar	Roof 6	NA/PS	TRC/2012
85	FL5-black/silver perimeter flashing tar	Roof 6	NA/PS	TRC/2012
86	FL6-silver/black penetration flashing tar	Roof 5	3.20 chrysotile*	TRC/2012
87	FL6-silver/black penetration flashing tar	Roof 5	ND<1%	TRC/2012
88	FL6-silver/black penetration flashing tar	Roof 5	ND<1%	TRC/2012
89	FL7-black perimeter flashing tar	Roof 5	ND<1%*	TRC/2012
90	FL7-black perimeter flashing tar	Roof 5	ND<1%	TRC/2012
91	FL7-black perimeter flashing tar	Roof 5	ND<1%	TRC/2012
92	FL8-black soft , stretchy flashing tar on rubber patches around down spouts in roof gutters	Roof 5	ND<1%*	TRC/2012
93	FL8-black soft , stretchy flashing tar on rubber patches around down spouts in roof gutters	Roof 5	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
94	FL8-black soft , stretchy flashing tar on rubber patches around down spouts in roof gutters	Roof 5	ND<1%	TRC/2012
95	FL9-black patch flashing tar on top of parapet	Roof 5	5% chrysotile	TRC/2012
96	FL9-black patch flashing tar on top of parapet	Roof 5	NA/PS	TRC/2012
97	FL9-black patch flashing tar on top of parapet	Roof 5	NA/PS	TRC/2012
98	BUT1-built-up tar roofing (top tar layer only)	Roof 4	20% chrysotile	TRC/2012
99	BUT1-built-up tar roofing (top tar layer only)	Roof 4	NA/PS	TRC/2012
100	BUT1-built-up tar roofing (top tar layer only)	Roof 4	NA/PS	TRC/2012
101	BUT2-built-up tar roofing (top tar layer only)	Roof 6	ND<1%*	TRC/2012
102	BUT2-built-up tar roofing (top tar layer only)	Roof 6	ND<1%	TRC/2012
103	BUT2-built-up tar roofing (top tar layer only)	Roof 6	ND<1%	TRC/2012
104	BUT3-built-up tar roofing (top tar layer only)	Roof 5-loc A	ND<1%*	TRC/2012
105	BUT3-built-up tar roofing (top tar layer only)	Roof 5-loc B	ND<1%	TRC/2012
106	BUT3-built-up tar roofing (top tar layer only)	Roof 5-loc C	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
107	RVB1-black vapor barrier under metal parapet cap	Roof 3	ND<1%*	TRC/2012
108	RVB1-black vapor barrier under metal parapet cap	Roof 3	ND<1%	TRC/2012
109	RVB1-black vapor barrier under metal parapet cap	Roof 3	ND<1%	TRC/2012
110	VB1-black paper vapor barrier	Roof 6	ND<1%	TRC/2012
111	VB1-black paper vapor barrier	Roof 6	ND<1%	TRC/2012
112	VB1-black paper vapor barrier	Roof 6	ND<1%	TRC/2012
113	AS1-maroon asphalt shingle	Roof 7	ND<1%*	TRC/2012
114	AS1-maroon asphalt shingle	Roof 7	ND<1%	TRC/2012
115	AS1-maroon asphalt shingle	Roof 7	ND<1%	TRC/2012
116	RR1-tan asphalt roll-on	Roof 3	ND<1%*	TRC/2012
117	RR1-tan asphalt roll-on	Roof 1	ND<1%	TRC/2012
118	RR1-tan asphalt roll-on	Roof 1	ND<1%	TRC/2012
119	RR2-multi-color asphalt roll-on walkway	Roof 3	ND<1%*	TRC/2012
120	RR2-multi-color asphalt roll-on walkway	Roof 2	ND<1%	TRC/2012
121	RR2-multi-color asphalt roll-on walkway	Roof 3	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
122	RR3-dark grey asphalt roll-on	Roof 7	ND<1%*	TRC/2012
123	RR3-dark grey asphalt roll-on	Roof 7	ND<1%	TRC/2012
124	RR3-dark grey asphalt roll-on	Roof 7	ND<1%	TRC/2012
125	TP1-grey transite shingle	Roof 6	20% chrysotile	TRC/2012
126	TP1-grey transite shingle	Roof 6	NA/PS	TRC/2012
127	TP1-grey transite shingle	Roof 6	NA/PS	TRC/2012
128	CB1-6" black covebase	Room 3	ND<1%*	TRC/2012
129	CB1-6" black covebase	Room 10	ND<1%	TRC/2012
130	CB2-tan glue behind 6" brown covebase	Room 9	ND<1%*	TRC/2012
131	CB2-tan glue behind 6" brown covebase	Room 9	ND<1%	TRC/2012
132	CB2-tan glue behind 6" brown covebase	Copy room	ND<1%	TRC/2012
133	CB3-cream glue behind 6" green covebase	Nurse 1	ND<1%*	TRC/2012
134	CB3-cream glue behind 6" green covebase	Nurse 1	ND<1%	TRC/2012
135	CB3-cream glue behind 6" green covebase	Nurse 1	ND<1%	TRC/2012
136	CB4-super sticky yellow glue behind 4" black covebase	Hallway – north end (55 wing)	ND<1%*	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
137	CB4-super sticky yellow glue behind 4" black covebase	Hallway – north end (55 wing)	ND<1%	TRC/2012
138	CB4-super sticky yellow glue behind 4" black covebase	Hallway – north end (55 wing)	ND<1%	TRC/2012
139	CBG1-dark brown glue behind CB1	Room 3	ND<1%*	TRC/2012
140	CBG2-tan covebase glue	Library	ND<1%*	TRC/2012
141	CBG2-tan covebase glue	Library	ND<1%*	TRC/2012
142	CBG2-tan covebase glue	Library	ND<1%	TRC/2012
143	Sheetrock/joint compound	Multimedia room – NE corner (77 wing)	ND<1%	TRC/2012
144	Sheetrock/joint compound	Kindergarten – quad 2 (77 wing)	ND<1%	TRC/2012
145	PL1-skimcoat/basecoat	Room 5 (55 wing)	ND<1%	TRC/2012
146	SHR3-grey sheetrock (no JC)	Room 8	ND<1%	TRC/2012
147	SHR3-grey sheetrock (no JC)	Room 8	ND<1%	TRC/2012
148	SHR3-grey sheetrock (no JC)	Room 8	ND<1%	TRC/2012
149	CT5-2'x4' divot pinhole ceiling tiles	Nurse 1	ND<1%	TRC/2012
150	CT5-2'x4' divot pinhole ceiling tiles	Nurse 1	ND<1%	TRC/2012
151	CT5-2'x4' divot pinhole ceiling tiles	Nurse 1	ND<1%	TRC/2012
152	SI1-grey sink undercoating	Café	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
153	SI1-grey sink undercoating	Café	ND<1%	TRC/2012
154	SI1-grey sink undercoating	Nurse 1	ND<1%	TRC/2012
155	SI2-white sink undercoating	MMC2	ND<1%	TRC/2012
156	SI2-white sink undercoating	MMC2	ND<1%	TRC/2012
157	SI2-white sink undercoating	MMC2	ND<1%	TRC/2012
158	SPL1-soft cream plaster	Basement-boiler room	ND<1%	TRC/2012
159	SPL1-soft cream plaster	Basement-boiler room	ND<1%	TRC/2012
160	SPL1-soft cream plaster	Basement-boiler room	ND<1%	TRC/2012
161	FB1-tan firebrick	Basement-incinerator room	ND<1%	TRC/2012
162	FB1-tan firebrick	Basement-incinerator room	ND<1%	TRC/2012
163	FB1-tan firebrick	Basement-incinerator room	ND<1%	TRC/2012
164	Maroon levelastic	Resource room (by exterior door)	ND<1%	TRC/2012
165	FD1-cream fire door insulation	Basement-incinerator room	ND<1%	TRC/2012
166	FD1-cream fire door insulation	Basement-incinerator room	ND<1%	TRC/2012
167	FD1-cream fire door insulation	Basement-incinerator room	ND<1%	TRC/2012
168	LFP1-light fixture paper insulation	Basement-incinerator room	40% chrysotile	TRC/2012
169	LFP1-light fixture paper insulation	Basement-incinerator room	NA/PS	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
170	LFP1-light fixture paper insulation	Basement-incinerator room	NA/PS	TRC/2012
171	TCP2-textured ceiling coating	Café	ND<1%	TRC/2012
172	TCP2-textured ceiling coating	Café	ND<1%	TRC/2012
173	TCP2-textured ceiling coating	Café	ND<1%	TRC/2012
174	TCP3-light texture coating (over shr)	Nurse 2	ND<1%	TRC/2012
175	TCP3-light texture coating (over shr)	Nurse 2	ND<1%	TRC/2012
176	TCP3-light texture coating (over shr)	Nurse 2	ND<1%	TRC/2012
177	Greenish mastic under gym flooring material	Gym	ND<1%*	TRC/2012
178	Greenish mastic under gym flooring material	Gym	ND<1%	TRC/2012
179	VB2-black vapor barrier under stage flooring (3" down)	Stage	ND<1%	TRC/2012
180	VB2-black vapor barrier under stage flooring (3" down)	Stage	ND<1%	TRC/2012
181	VB2-black vapor barrier under stage flooring (3" down)	Stage	ND<1%	TRC/2012
182	PSS1-white pipe seam sealant on fiberglass/PVC	Basement – boiler room	ND<1%	TRC/2012
183	PSS1-white pipe seam sealant on fiberglass/PVC	Basement – boiler room	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
184	PSS1-white pipe seam sealant on fiberglass/PVC	Basement – boiler room	ND<1%	TRC/2012
185	PSS2-white pipe seam sealant on fiberglass/PVC	Mech room (77 wing)	ND<1%	TRC/2012
186	PSS2-white pipe seam sealant on fiberglass/PVC	Mech room (77 wing)	ND<1%	TRC/2012
187	PSS2-white pipe seam sealant on fiberglass/PVC	Mech room (77 wing)	ND<1%	TRC/2012
188	Mudded fittings on heating line	Boy's locker room	ND<1%	TRC/2012
189	Mudded fittings on heating line	Hall – outside unit room 2	ND<1%	TRC/2012
190	Mudded fittings on heating line	Custodial office '77	ND<1%	TRC/2012
191	Mudded fittings on water line	Boy's locker room	ND<1%	TRC/2012
192	Mudded fittings on water line	Hall – outside unit room 2	ND<1%	TRC/2012
193	Mudded fittings on water line	Custodial office '77	ND<1%	TRC/2012
194	MGD1-tan mirror glue daubs	Boys lav by gym	ND<1%*	TRC/2012
195	CTG1-dark brown glue daubs behind 1'x1' cellulose CT's	Room 3	ND<1%*	TRC/2012
196	CTG1-dark brown glue daubs behind 1'x1' cellulose CT's	Room 3	ND<1%	TRC/2012
197	CTG1-dark brown glue daubs behind 1'x1' cellulose CT's	Room 3	ND<1%	TRC/2012
198	G1-dark brown glue daubs behind 1.5' square tectum wall blocks	Gym – south wall	ND<1%*	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
199	G1-dark brown glue daubs behind 1.5' square tectum wall blocks	Gym – south wall	ND<1%	TRC/2012
200	G1-dark brown glue daubs behind 1.5' square tectum wall blocks	Gym – south wall	ND<1%	TRC/2012
201	WPG1-orange wall panel glue behind plastic wall panel	Kitchen	ND<1%*	TRC/2012
202	WPG1-orange wall panel glue behind plastic wall panel	Kitchen	ND<1%	TRC/2012
203	WPG2-tan wall panel glue behind stain fiberboard wall panel	Kitchen office	ND<1%*	TRC/2012
204	WPG2-tan wall panel glue behind stain fiberboard wall panel	Kitchen office	ND<1%	TRC/2012
205	WPG2-tan wall panel glue behind stain fiberboard wall panel	Kitchen office	ND<1%	TRC/2012
206	WPG3-dark brown wall panel glue behind counter backing	Room 8	ND<1%*	TRC/2012
207	WPG3-dark brown wall panel glue behind counter backing	Room 4	ND<1%	TRC/2012
208	WPG3-dark brown wall panel glue behind counter backing	Room 4	ND<1%	TRC/2012
209	WPG4-tan glue behind green ceramic basebaord	Room 5	ND<1%*	TRC/2012
210	WPG4-tan glue behind green ceramic basebaord	Room 5	ND<1%	TRC/2012
211	WPG4-tan glue behind green ceramic basebaord	Room 5	ND<1%	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
212	C1-white flexible caulk	Girls bathroom	ND<1%*	TRC/2012
213	C2-grey hard, semi flexible caulk	South entry	ND<1%*	TRC/2012
214	C4-white flexible caulk	Café	ND<1%*	TRC/2012
215	C5-hard pliable grey caulk	Foyer-NW door	3% chrysotile	TRC/2012
216	C6-brown hard caulk	Unit room 1	3% chrysotile	TRC/2012
217	C6A-hard grey caulk	Multimedia center	ND<1%*	TRC/2012
218	C7-dark brown flexible caulk	Exterior – café north	TR	TRC/2012
219	C9-dark brown brittle caulk (faded white exterior)	Exterior – café east	3% chrysotile	TRC/2012
220	C11-red brittle caulk	Exterior – 55 wing west	3.75 chrysotile*	TRC/2012
221	C12—hard brittle white caulk	Exterior – 55 wing west	1.86% anthophyllite	TRC/2012
222	C13-flexible brown caulk	Exterior – east side of 77 wing	ND<1%*	TRC/2012
223	C14-grey soft flexible caulk	Exterior – east side of 77 wing	ND<1%*	TRC/2012
224	C15-white semi-flex caulk (tan interior)	Roof 3	ND<1%*	TRC/2012
225	C16-flexible grey caulk (powdery exterior)	Roof 6	ND<1%*	TRC/2012
226	C17-brown flexible caulk	Roof 3	ND<1%*	TRC/2012
227	WG1-brown window glaze on interior metal framed windows	Room 4	TR	TRC/2012

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-1
BULK SAMPLE SUMMARY OF SUSPECT ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	% and Type Asbestos	Taken by /Year
228	WG2-black putty window glaze on door/window unit	South entry	ND<1%*	TRC/2012
229	WG3-grey putty window glaze	Café	7.28% chrysotile*	TRC/2012
230	WG4-hard grey window glaze on doors	Hallway by AV room	TR	TRC/2012
231	WG5-semi-hard grey window glaze on door/window systems	Windows by main office	TR	TRC/2012
232	WG6- dark greyish-brown hard brittle window glaze (on exterior & interior of windows)	Library –east window	3.61% chrysotile*	TRC/2012
233	WG7-brown flexible glaze on door window	Exterior door – NW foyer	TR	TRC/2012
234	Exterior soft felxible grey joint caulk	Exterior gym	ND<1%*	TRC/2012
235	Interior brown pliable joint caulk	Gym	5.98% chrysotile*	TRC/2012
71-BG	Blackboard glue	Room 3 SE corner	ND<1%*	TRC/2012
72-BG	Blackboard glue	Room 8 East wall	10.73%* chrysotile	TRC/2012
	Note: Numbers 71 and 72 were used twice			

ND - non detected
TR - trace less than 1%
NA/PS - not analyzed, positive stop
*Analyzed by TEM

TABLE 3-2
ASBESTOS-CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Material	Location	Square Feet (SF)/ Linear Feet (LF)
Floor Tile and Associated Mastic	See Drawing in Rear of Report	16,060 SF
Black board glue	See Drawing	2800 SF
Mudded fittings behind fixed walls '55 wing	See Drawing	100 EA
Internal boiler insulation	See Drawing	400 SF
Window/door caulk	See Drawing	1400 LF
Window glazing putty	See Drawing	13 EA
Pipe insulation behind fixed walls '55wing	See Drawing	100 LF
Transite shingles on roof	See Drawing	135 SF
Roofing material	See Drawing	21,600 SF
Expansion joint caulk	See Drawing	800 LF
Light fixture paper insulation	See Drawing	1 SF

TABLE 3-3
NON-ASBESTOS CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Material
Sheetrock/Joint Compound
Cove base and associated mastic
Ceiling tiles
Carpet mastic
Sink insulation
Plaster
Levelastic
Boiler insulation - exterior
Boiler breeching insulation
Flexible duct connectors
Fiberglass pipe insulation
Textured ceiling paint
Vapor barrier under wooden stage floor
Asphalt shingles
Mudded fittings '77 wing
Gym floor mastic
Pipe seam insulation
Fire door insulation
Incinerator firebrick
Wall panel glue
Mirror glue daubs
Glue daubs behind square tectum wall blocks in gym
Glue daubs under fiber cane ceiling tiles
Glue behind ceramic baseboard
Some caulks
Some glazing putty

TABLE 5-1 SUMMARY OF RADON SAMPLES CRYSTAL LAKE SCHOOL ELLINGTON, CONNECTICUT			
Canister No.	**Sample Location**	**Radon Conc. p Ci/l**	**Taken by /Year**
1970	Room 10	ND<0.5	TRC/2012
1413	Room 3	ND<0.5	TRC/2012
1083	Office	ND<0.5	TRC/2012
3051	Grade 1	ND<0.5	TRC/2012
1546	Grade 1 - Duplicate	ND<0.5	TRC/2012
3188	Field blank	ND<0.5	TRC/2012

p Ci/l = pico-curies/liter – The US EPA has set a Continuous Exposure Action Level of 4 p Ci/l as a guidance level at which further testing and/or remedial action are indicated. The canisters listed above were set out for approximately 48 hours. Radon analysis reports can be found in the appendix, attached.

TABLE 6-1
BULK SAMPLE SUMMARY OF SUSPECT MERCURY CONTAINING MATERIAL
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Sample No.	Homogeneous Suspect Material Description	Sample Location	ppm	Taken by /Year
01	Rubber floor	NW door to exterior	481	TRC/2012

TABLE 8-1
SUMMARY OF SUSPECT PCB BULK PRODUCT
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Bulk Material ID	Material Description	Location	Estimated Quantity	Total PCBs (mg/kg)	Material Classification
C1A	White flexible window caulk	55 Wing Bathrooms	40 LF	ND<0.810	Excluded PCB Product
C1B	White flexible window caulk			ND<0.790	Excluded PCB Product
WG1A	Brown window glazing on interior windows	55 Wing Main Hallway	15 windows	ND<0.780	Excluded PCB Product
WG1B	Brown window glazing on interior windows			ND<0.740	Excluded PCB Product
WG1C	Brown window glazing on interior windows			**5.3**	**Excluded PCB Product/State Regulated**
C2A	Grey semi flexible caulk	55 Wing Exterior Main Entrance Doors	50 LF	ND<0.790	Excluded PCB Product
C2B	Grey semi flexible caulk			ND<0.790	Excluded PCB Product
WG2A	Black putty door window glazing	55 Wing Exterior Main Entrance Doors	5 doors	ND<0.820	Excluded PCB Product
WG2B	Black putty door window glazing			ND<0.790	Excluded PCB Product
WG2C	Black putty door window glazing			ND<0.760	Excluded PCB Product
C3A	Clear silicone caulking	55 Wing Exterior Classroom Doors	5 doors	ND<0.810	Excluded PCB Product
C3B	Clear silicone caulking			ND<0.810	Excluded PCB Product
C4A	White flexible caulking	55 Wing Cafeteria	4 window systems	ND<0.720	Excluded PCB Product
C4B	White flexible caulking			ND<0.810	Excluded PCB Product
C4C	White flexible caulking			ND<0.800	Excluded PCB Product
WG3A	Grey putty window glazing	55 Wing Cafeteria	2 window systems	ND<0.760	Excluded PCB Product
WG3B	Grey putty window glazing			ND<0.780	Excluded PCB Product
WG4A	Hard grey door window glazing	55 Wing to 77 Wing	2 doors	ND<1.00	Excluded PCB Product
WG5A	Semi hard grey window glazing on door & window system	77 Wing Exterior Door Systems	14 window systems	ND<0.760	Excluded PCB Product
WG5B	Semi hard grey window glazing on door & window system			ND<0.820	Excluded PCB Product
WG5C	Semi hard grey window glazing on door & window system			ND<0.830	Excluded PCB Product
C5A	Hard pliable grey caulking	77 Wing Exterior Door Systems	14 window systems	ND<0.790	Excluded PCB Product
C5B	Hard pliable grey caulking			ND<0.780	Excluded PCB Product
C5C	Hard pliable grey caulking			ND<0.760	Excluded PCB Product
C6A	Brown hard caulking	77 Wing Windows (Interior)	12 window systems	ND<0.760	Excluded PCB Product
C6B	Brown hard caulking			ND<0.820	Excluded PCB Product

TABLE 8-1
SUMMARY OF SUSPECT PCB BULK PRODUCT
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Bulk Material ID	Material Description	Location	Estimated Quantity	Total PCBs (mg/kg)	Material Classification
C6C	Brown hard caulking			ND<0.730	Excluded PCB Product
WG6A	Dark grey hard brittle glazing	77 Wing Windows	12 window systems	ND<0.800	Excluded PCB Product
WG6B	Dark grey hard brittle glazing			ND<0.830	Excluded PCB Product
WG6C	Dark grey hard brittle glazing			ND<0.820	Excluded PCB Product
WG7A	Brown flexible glazing	77 Wing Exterior West Entrance	2 doors	ND<0.770	Excluded PCB Product
C6AA	Hard grey caulking	77 Wing Multimedia Room	1 door system	ND<0.820	Excluded PCB Product
C7A	Dark brown flexible caulking	55 Wing Cafeteria & East Side Classrooms (Exterior)	9 window systems	ND<2.50 ***Retest ND<0.299***	Excluded PCB Product
C7B	Dark brown flexible caulking			ND<0.740	Excluded PCB Product
C7C	Dark brown flexible caulking			ND<0.800	Excluded PCB Product
C9A	Dark brown brittle caulking	55 Wing Cafeteria & East Side Classrooms (Exterior)	9 window systems	ND<0.780	Excluded PCB Product
C9B	Dark brown brittle caulking			ND<0.810	Excluded PCB Product
C9C	Dark brown brittle caulking			ND<0.780	Excluded PCB Product
C10A	Brown silicone caulking	55 Wing Cafeteria (Exterior)	4 window systems	ND<0.770	Excluded PCB Product
C10B	Brown silicone caulking			ND<0.810	Excluded PCB Product
C11A	Red brittle window caulking	55 Wing West Side Classroom Windows (Exterior)	4 window systems	ND<0.790	Excluded PCB Product
C11B	Red brittle window caulking			ND<0.950	Excluded PCB Product
C12A	Hard brittle white window caulking	55 Wing West Side Windows (Exterior)	3 window systems	ND<0.790	Excluded PCB Product
C12B	Hard brittle white window caulking			ND<0.780	Excluded PCB Product
C13A	Brown flexible window caulking	77 Wing Window Systems (Exterior)	13 window systems	ND<76 ***Retest ND<0.251***	Excluded PCB Product
C13B	Brown flexible window caulking			ND<45 ***Retest ND<0.220***	Excluded PCB Product
C13C	Brown flexible window caulking			ND<46 ***Retest ND<0.226***	Excluded PCB Product

APPENDIX A

ASBESTOS BULK SAMPLE CHAIN-OF-CUSTODY FORMS AND PLM/DS LABORATORY ANALYSIS RESULTS

DR. CLARENCE WELTI, P.E., P.C.

GEOTECHNICAL ENGINEERING

227 Williams Street • P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

January 14, 2013

Mr. Peter R. Williams
Permanent School Building Committee
55 Main Street, P.O. Box 187
Ellington, CT 06029

Re: Preliminary Geotechnical Study for Proposed Addition/Alterations at Crystal Lake Elementary School, 284 Sandy Beach Road; Ellington, CT

Dear Mr. Williams:

1.0 Herewith are the boring data pertaining to the above. Fifteen borings were drilled at the proposed building addition and contiguous site improvement to a maximum depth of 25.6 feet below the existing grades. The borings were drilled to at least 10 feet into competent bearing strata, to a minimum depth of 20 feet below the existing grades, or to auger refusal if above 20 feet. In addition to the borings three test pits, which were excavated by the Town of Ellington, were inspected and logged. The data from the test pits are included in the appendix. The boring locations were staked in the field by the Town of Ellington and 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 ten grain size gradation and water content tests on selected soil samples. The results of those tests are included in the appendix.

2.0 The **Subject Project** will include the construction a one story slab on grade building with a footprint of about 14,500 sf. The floor level of the existing building varies from Elev. 684 at the west section and at Elev. 686.7 at the east section. It is presumed that the floor level of the proposed addition will match a lower floor level of the existing school. In addition to the proposed building addition there will be three new athletic fields and there will be a new access road from South Road, plus reconfigured roadways and parking around the site.

2.1 The **existing grades at the proposed building addition** range from about Elev. 670 to Elev. 684. The new access road from South Road will have about 26 feet of relief (from Elev. 660± at South Road to Elev. 686 at the school. The reconfigured parking and access driveways north of the school will be close to existing grade. The proposed parking areas to the south and west of the proposed building addition have topography ranging from Elev. 668 to Elev. 672.

[redacted]

condition is discussed further herein with recommendations for earthwork on the site.

3.0 The **Geologic Origin** of the natural inorganic soils is from glacial moraine deposits. The moraine consists of fine to medium sand with little to some silt and gravel.

3.1 The **Soils Cross Sections** from the borings are generally as follows:

Proposed Building Addition (see borings B-3 thru B-8)

Topsoil to 6" to 8"

Locally FILL (see boring B-5); fine to medium SAND, some Silt, little Gravel, medium compact
Note: There will be fills adjacent to the existing building and utilities.

Fine to medium SAND, some Silt, trace Gravel to 2 to 3 feet, loose to medium compact

Fine to medium SAND, some Silt, trace Gravel 5 about 10 feet, dense

Fine to medium SAND, little to some Silt, trace Gravel and Cobbles to auger refusal at 14 to 21.5+ feet, dense to very dense

Ground water, where evident in the boreholes, was at 9 to 17 feet below the existing grades at the completion of the borings (Elev.661 to Elev.665). Water contents at boring B-3 indicated saturated soil at 4 feet below grade, but the water table was generally below 10 feet below grade at completion of the borings. Based on sample water contents, wet season water tables could be within 8 feet of the existing grade.

Parking Area and Roadway at North End (see boring B-1) in Existing Parking Area

Bituminous Concrete to 2.5"

Fine to coarse SAND, little Gravel, little Silt to 12", dense

Fine to medium SAND, little Silt and Gravel to 3 feet, dense

Fine to medium SAND, some Silt, trace Gravel, few Cobbles to 20+ feet, very dense

Ground water was not apparent at boring completion and on inspection of soil samples

Access Road from South Road to School (see Test Pits TP-1 and TP-2 & Boring B-2)

At tests pits; Topsoil to 12" to 24"

Subsoil; fine SAND and SILT, trace Roots, Gravel and Cobbles to 3 to 3.5 feet, loose/soft

Fine to medium SAND, little to some Silt and Gravel to bottom of test pit at 8 to 8.5 feet

The soil at test pit TP-2 was saturated below 6 feet and the **ground water** near South Road will be within 4 feet of grade in wet seasons.

At boring B-2; Topsoil to 7" atop fine to medium SAND, some Silt, trace Gravel to 21.5+ feet (no evident ground water)

Parking and Playground Areas to South of Building Addition (see borings B-4, B-6 and B-9)

Topsoil 6" to 8"

Locally Possible FILL or disturbed soils (see boring B-9); fine to medium SAND, some Silt, trace Gravel, loose to medium compact

Fine to medium SAND, some Silt, trace Gravel to 5 to 10 feet, medium compact to dense

Fine to medium SAND, little to some Silt, trace to little Gravel, few Cobbles to 20+ feet, dense to very dense

Ground water was at 11 feet below the existing grade at the completion of boring B-9 (Elev.667). Inspection of soil samples indicate the water table will be within 8 feet of grade in wet seasons.

The area to the east of the school is an existing paved lot with 2" of Bituminous Concrete on Sand and Gravel with little Silt to about 2 feet below grade (based on boring B-15)

Athletic Field East of Parking Area (see borings B-9 and B-10)

Topsoil to 6" to 9"

At boring B-9; fine to medium SAND, some Silt, trace Gravel; loose to medium compact

At boring B-10; fine to medium SAND, little Silt 5.5 feet, loose to medium compact

Fine to medium to fine to coarse SAND, little to some Silt, trace to little Gravel to 20+ feet, dense

to very dense

Ground water was 6.5 to 11 feet below the existing grades at the completion of the borings (Elev.667 to Elev.670). There will be saturated soils due to capillary water to 2+ feet above the hydrostatic levels.

Southeast Athletic Field (see borings B-11 and B-12)

Topsoil 6" to 8"

Subsoil; fine medium SAND, some Silt, trace Gravel, trace Roots to about 2 feet, loose

Fine to coarse SAND, some Silt, trace Gravel, few Cobbles auger refusal to 14 to 22.5 feet, dense to very dense

Ground water was at about 4 feet below grade and there may be capillary water above this level.

Southwest Athletic Fields (see borings B-13 and B-14 + Test Pit TP-3)

Topsoil 4" to 12"

Locally Fill; fine to coarse SAND, little Silt, trace Asphalt to 1.5 feet below grade

Subsoil (see TP 3); fine to medium SAND, some Silt, trace Roots to 2 feet, loose

Fine to medium SAND, some Silt, trace to little Gravel, medium compact to dense to about 10 feet below grade

Fine to medium SAND, some Silt, little Gravel, few Cobbles and Boulders to 20+ feet, very dense

Ground water was 3 to 8 feet below grade below the existing grades at the completion of borings and test pit (Elev.681 to Elev.667) .

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

1. The maximum total settlement shall not exceed 3/4" and the maximum differential settlement shall 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 can be **"C"**. The mapped MCE spectral response acceleration values for Ellington, CT are $\mathbf{S_1 = 0.064}$ for one second period and $\mathbf{S_S = 0.233}$ for short period. For transfer of ground shear into the soil the ultimate friction factor should be **0.50.**

5.0 Regarding **Foundation Type,** the building can be supported on spread footings. The footings can be on the natural inorganic soils with the required sub grade preparation, or on a controlled fill placed after the removal of any topsoil, subsoils and existing fills. It is not clear if there will be a lower level at the west end of the proposed building. If this is the case, footings may be locally into saturated soils. These natural soils are compact, but can readily remold. To address this condition there shall be a minimum of 8" of crushed 3/8" stone beneath footings, which are within 2 feet of the estimated water table level. If there is a partial lower level, there will be soil retention over part of the wall system. Backfill of all walls, which are retaining soil, shall be with material, cited in section 6.0 below. If there is no lower level, footings, where on natural soils, shall be placed at least 3 feet below existing grade and at least 3.5 feet below finish exterior grades. A 6" layer of 3/8" crushed stone is recommended under footings as a working surface, where on the natural soil. If the west end of the building is on a controlled structural fill, the controlled structural fill shall be extended laterally for a distance outside the foundation equal to the depth of fill below the footings plus 5 feet. Controlled fills shall conform to section 6.0 below.

5.1 The **Allowable Bearing Pressure** for spread footings on the natural inorganic soils, on the crushed stone atop the natural inorganic soils or on the controlled fill can be 4,000 psf. At retaining walls the maximum pressure on the toe can be 50% higher than the average pressures, cited above.

5.2 The **Lateral Soil Loading** (static) on retaining walls that are part of the building shall be based on at-rest pressure using the at-rest coefficient cited in the table below. Lateral soil loading on retaining walls apart from the building can be designed with active pressure using the coefficient cited below for level backfill. The backfill for the walls shall conform to the material specification of section 6.0 below and shall extend laterally behind the walls for a distance equal to at least the wall height measured from footing bottom to finished grade. The ultimate sliding coefficient for concrete on the soil or crushed stone underlayment is **0.60. Lateral loading on retaining walls apart from the building can be designed with active pressure**

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

5.4 Summary of Foundation Design Parameters:

Parameter	Value
Allowable Bearing Pressure for footings with preparation per section 5.0 above	4,000 psf
Soil Unit Weight (Backfill) *	120 pcf
Internal Friction Angle (Backfill) *	34°

At-Rest Pressure Coefficient, K_O	0.45
Active Pressure Coefficient, K_A (level backfill)	0.28
Ultimate Sliding Coefficient, concrete on crushed stone over soil	0.60
Seismic Site Soil Profile Classification	C
Mapped MCE Spectral Response Acceleration for one second period, S_1	0.064
Mapped MCE Spectral Response Acceleration for short period, S_S	0.233
Frost Protection Depth	3.5 feet

* Backfill material conforming to 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 shall conform to the following or be 3/8" crushed stone:

Percent Passing	Sieve Size
100	3.5"
50 - 100	3/4"
25 - 75	No.4

The fraction, passing the No.4 sieve shall 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 There should be at least 16" of controlled fill, conforming to section 6.0 above, placed beneath slabs on grade. The final 4" layer directly beneath slab on grade floor slabs shall be with 3/8" crushed stone or 3/4" minus processed stone base. All existing fills (if any) and topsoil shall be removed beneath the floors. If the floor subgrades fall on wet soils, there will be a requirement for placement of a minimum 6" layer of 3/8" crushed stone over the sub grade prior to placing the controlled fill. A vapor retarder is required beneath the slab on grade floors.

6.1.1 If there is a basement or lower floor level (with a floor slab below the finished exterior grades) there shall footing drains and interior under drain system with 9"of 3/8" crushed stone beneath the floor. Water stops are required at the footing/wall interface and at the floor/wall interface in such areas. If the areas are used for other mechanical purposes, there shall be water proofing of the

floor and wall. If the area is only for mechanical purposes, a heavy vapor retarder could used beneath the floor slab.

7.0 Regarding Earthwork, excavations in the natural soils will fall in OSHA Class B. This will require sloping excavations, which are not shored and exceed 5 feet in height, to be cut back to slopes less than 45° from the horizontal.

7.1 Long Term Slopes in earth cuts and fills shall be 2:1, or flatter.

8.0 Regarding New Pavements, the sub grades will in most cases fall on frost susceptible moraine. There should be least 10" of material (subbase) conforming to section 6.0 above placed beneath the pavement sections. The recommended pavement sections above the subbase are as follows:

For passenger car parking: 3.0" bituminous concrete (two lifts) on 6" of processed stone base over gravel subbase

For bus and truck access areas: 4.5" bituminous concrete (two lifts) on 8" of processed stone base

There should be at 24" of material conforming to the gradation in section 6.0 above placed beneath Concrete Pavements which are in close proximity to the building.

8.0.1 If the pavements are in cuts there shall be edge drains, placed at 12" below the bottom of the subbase and backfilled with 3/8"crushed stone. In addition there shall be an under drain in the middle of the parking areas.

8.0.2 Regarding the access road from South Road, part of the embankment near Route 30 may be over a wet sub grade. There shall be an initial 12" layer of crushed 3/8" beneath the embankment. Where the roadway in a cut there shall be edge drains. Cut slopes higher than 4 feet will require stone wedges tied to the drains.

8.1 For Portland Cement Concrete the concrete thickness for buses and light truck traffic would be 6". This would be placed on 12" of gravel subbase.

9.0 Regarding treatment in Athletic Fields there is at least 8± feet of topographic relief across each of the field footprints.

9.1 The field immediately south of the proposed addition can be excavated and filled after stripping topsoil, largely with on site soils. However in wet seasons, it may necessary to place an initial 12" lift of 3/8" crushed stone to exclude capillary water migration into the controlled embankment. The embankment shall be carried up to within 2 feet of the proposed field grade and the excavation at the east end shall be cut to 2 feet below the finished grade. The material to the bottom of the top soil shall conform to the gradation in section 6.0 above . There shall be under drains in the section of field in a cut and possibly a separate under drain system, if the field is irrigated..

9.2 At the southeast field there about 12 feet of topographic relief. With the present water table at about 4 feet at the south edge of the field and capillary water to 2 feet of above the hydrostatic level, the soils below 2 feet will be saturated and would therefore be difficult to place and compact on the north (low) side of the field. It is recommended that the cut at the south end of the field be limited to 4 feet to avoid the excavation and placement of wet soils. **There should be at least 18" of controlled fill (see section 6.0 above) beneath the topsoil.** There will be a requirement for an under drain at the south edge of the field and at 40 feet centers to the edge of the cut section. It may be necessary to have a stone wedge at the toe of the slope at the south side of the field. If the field is irrigated, there would be a separate under drain system.

9.3 At the southwest field there is also about 12 feet of topographic relief. The water table appears to be somewhat lower at the south side of the field than at the southeast field. The cut at the south end of field should be limited to about 6 feet. Under drainage is required at the south side of the field. In general the recommendations cited for the southeast field should also apply to the southwest field.

10.0 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.

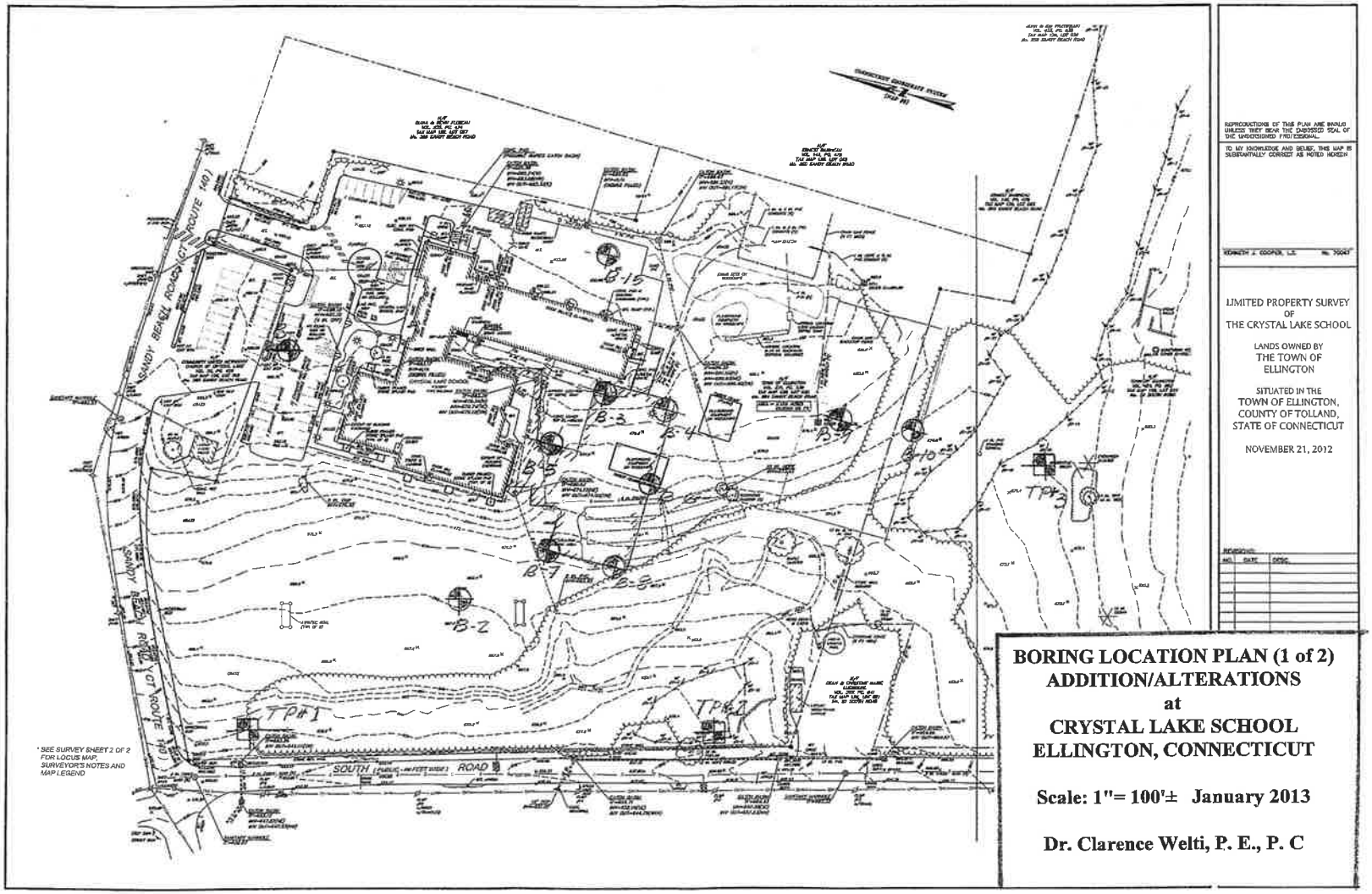
The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations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

Dr. Clarence Welti, P.E., 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.

Very truly yours,

Max Welti, P.E.

Clarence Welti Ph.D., P. E.
President, Dr. Clarence Welti P.E.; P.C.



REPRODUCTIONS OF THIS PLAN ARE INVALID UNLESS THEY BEAR THE EMBOSSED SEAL OF THE UNDERSIGNED PROFESSIONAL.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

KENNETH J. COOPER, L.S. NO. 70043

LIMITED PROPERTY SURVEY
OF
THE CRYSTAL LAKE SCHOOL

LANDS OWNED BY
THE TOWN OF
ELLINGTON

SITUATED IN THE
TOWN OF ELLINGTON,
COUNTY OF TOLLAND,
STATE OF CONNECTICUT

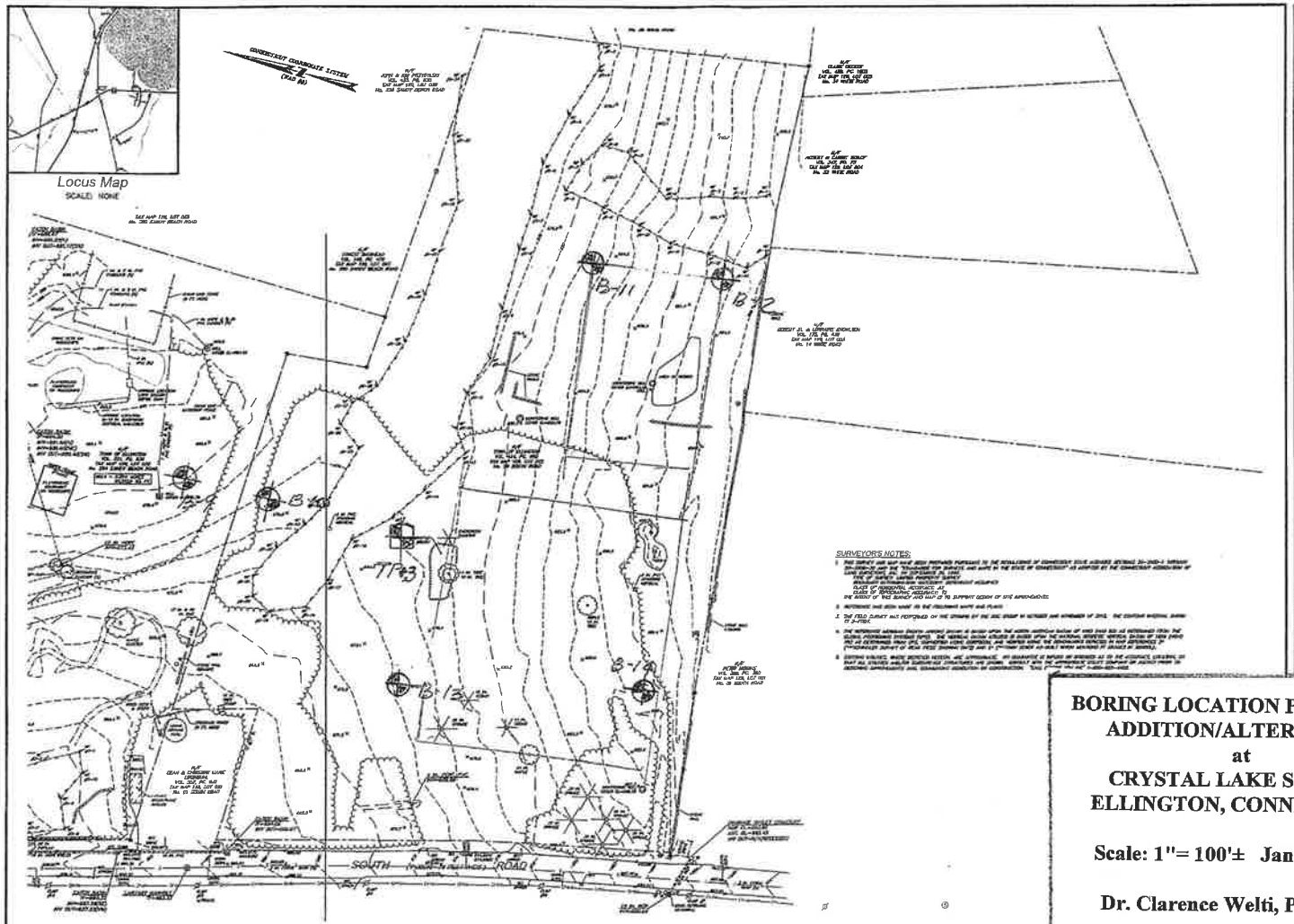
NOVEMBER 21, 2012

REVISIONS:		
NO.	DATE	DESC.

BORING LOCATION PLAN (1 of 2)
ADDITION/ALTERATIONS
at
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Scale: 1"= 100'± January 2013

Dr. Clarence Welti, P. E., P. C



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TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

KENNETH A. COOPER, L.S. No. 70947

LIMITED PROPERTY SURVEY
OF
THE CRYSTAL LAKE SCHOOL

LANDS OWNED BY
THE TOWN OF
ELLINGTON

SITUATED IN THE
TOWN OF ELLINGTON,
COUNTY OF TOLLAND,
STATE OF CONNECTICUT

NOVEMBER 21, 2012

REVISIONS:		
NO.	DATE	DESC.

BORING LOCATION PLAN (2 of 2)
ADDITION/ALTERATIONS
at
CRYSTAL LAKE SCHOOL
ELLINGTON, CONNECTICUT

Scale: 1"= 100'± January 2013

Dr. Clarence Welti, P. E., P. C

APPENDIX

BORING LOCATION PLAN
+
TEST BORING & TEST PIT LOGS
+
LABORATORY TEST RESULTS

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
TOWN OF ELLINGTON

PROJECT NAME
ADDITION TO CRYSTAL LAKE SCHOOL
LOCATION
284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 686.7
HOLE NO. B-1
GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS
START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS		ELEV.
0					ASPHALT	0.17	
	1	7-10-28-24	1.00'-3.00'		BR.FINE-CRS.SAND, LITTLE SILT, TRACE GRAVEL	1.0	
					GREY FINE-MED.SAND, LITTLE SILT & GRAVEL		685
	2	35-60	3.00'-4.00'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL,FEW COBBLES	3.0	
5	3	16-22-17-32	5.00'-7.00'				680
10	4	60	10.00'-10.42'				675
15	5	48-60	15.00'-16.00'				670
20	6	60	20.00'-20.08'		BOTTOM OF BORING @ 20.1'	20.1	665
25							660
30							655
35							

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:

SHEET 1 OF 1 | HOLE NO. B-1

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 668.5 | HOLE NO. B-2

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	2-5-7-15	0.00'-2.00'		TOPSOIL 0.56 BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 1.5 GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES	665
	2	18-23-40-48	2.00'-4.00'			
5	3	18-21-27-47	4.00'-6.00'			660
10	4	60	10.00'-10.50'			655
15	5	60	15.00'-15.25'			650
20	6	22-33-36	20.00'-21.50'		BOTTOM OF BORING @ 21.5' 21.5	645
25						640
30						635
35						

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:

SHEET 1 OF 1 | HOLE NO. B-2

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 682.5 | HOLE NO. B-3

GROUND WATER OBSERVATIONS
AT 17.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	7-13-14-22	0.00'-2.00'		TOPSOIL 0.50	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 1.0	
	2	12-10-11-12	2.00'-4.00'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES	680
	3	10-12-11-60	4.00'-5.83'			
5						675
10	4	11-16-25	10.00'-11.50'			
						670
15	5	60	15.00'-15.50'			
						665
20	6	35-60	20.00'-20.92'		BOTTOM OF BORING @ 20.9 20.9	
						660
25						
						655
30						
						650
35						

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:

SHEET 1 OF 1 | HOLE NO. B-3

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 681.0 | HOLE NO. B-4

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	2-5-6-5	0.00'-2.00'		TOPSOIL 0.50	680
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	
	2	4-5-6-8	2.00'-4.00'		GREY/BR.FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL 2.0	
	3	10-13-11-11	4.00'-5.83'			
5						675
					GREY/BR.FINE-CRS.SAND, LITTLE SILT & GRAVEL 8.0	
10	4	17-60	10.00'-10.83'			670
15	5	27-60	15.00'-15.92'			665
					GREY/BR.FINE-MED.SAND, SOME SILT 18.0	
20	6	21-42-60	20.00'-21.17'			660
					BOTTOM OF BORING @ 21.2 21.2	
25						655
30						650
35						

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-4

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 678.5 | HOLE NO. B-5

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS		ELEV.
0	1	3-11-13-14	0.00'-2.00'		TOPSOIL		
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL - FILL	0.66	
	2	12-15-25-40	2.00'-4.00'				
					RED/BR.FINE-MED.SAND, SOME SILT, LITTLE GRAVEL - FILL	3.0	675
	3	27-30-60	4.00'-5.50'				
5					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	5.0	
							670
10	4	17-29-39	10.00'-11.50'		GERY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES	10.0	
							665
					BOTTOM OF BORING @ 14.0' (AUGER REFUSAL)	14.0	
15							
							660
20							
							655
25							
							650
30							
							645
35							

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:

SHEET 1 OF 1 | HOLE NO. B-5

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 676.0 | HOLE NO. B-6

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS		ELEV.
0	1	3-7-8-5	0.00'-2.00'		TOPSOIL		
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	0.66	675
	2	14-13-27-30	2.00'-4.00'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL	2.5	
	3	25-20-32-25	4.00'-5.83'				
5							670
10	4	60	10.00'-10.25'		GREY/BR.FINE-MED.SAND, LITTLE SILT & GRAVEL, FEW COBBLES	10.0	665
15	5	60	15.00'-15.50'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES	15.0	660
20	6	60	20.00'-20.50'		BOTTOM OF BORING @ 20.5'	20.5	655
25							650
30							645
35							

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:

SHEET 1 OF 1 | HOLE NO. B-6

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 672.0 | **HOLE NO. B-7**

GROUND WATER OBSERVATIONS
AT 9.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	3-3-7-12-15	0.00'-2.00'		TOPSOIL 0.56	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 1.5	670
	2	13-17-15-22	2.00'-4.00'		GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	
	3	17-17-60	4.00'-5.25'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES 4.5	
5						665
10	4	31-40-44	10.00'-11.50'			660
15	5	43-55-60	15.00'-16.50'			655
20	6	60	20.00'-20.50'		BOTTOM OF BORING @ 20.5' 20.5	650
25						645
30						640
35						

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:

SHEET 1 OF 1 | HOLE NO. **B-7**

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.	OFFSET	SURFACE ELEV. 672.0	HOLE NO. B-8
TYPE	HSA		SS		LINE & STA.	GROUND WATER OBSERVATIONS	START DATE 12/26/12
SIZE I.D.	3.75"		1.375"		N. COORDINATE	AT 11.0 FT. AFTER 0 HOURS	
HAMMER WT.			140lbs		E. COORDINATE	AT FT. AFTER HOURS	FINISH DATE 12/26/12
HAMMER FALL			30"				

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	4-5-6-7	0.00'-2.00'		TOPSOIL	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 0.66	670
	2	8-12-12-27	2.00'-4.00'		GREY/BR.FINE-MED.SAND, LITTLE SILT, TRACE GRAVEL 2.5	
	3	24-60	4.00'-5.00'			
5					GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES 5.0	665
10	4	44-45-60	10.00'-11.50'			660
15	5	44-40-39	15.00'-16.50'			655
20	6	27-31-35	20.00'-21.50'			
					BOTTOM OF BORING @ 21.5' 21.5	650
25						645
30						640
35						

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:

SHEET 1 OF 1 | HOLE NO. B-8

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
TOWN OF ELLINGTON

PROJECT NAME
ADDITION TO CRYSTAL LAKE SCHOOL
LOCATION
284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 678.0
HOLE NO. **B-9**

GROUND WATER OBSERVATIONS
AT 11.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	3-2-3-2	0.00'-2.00'		TOPSOIL 0.50	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLE - POSSIBLE FILL OR DISTURBED SOILS	675
	2	1-2-7-7	2.00'-4.00'			
5	3	1-2-7-15	5.00'-7.00'		GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 5.0	670
10	4	60	10.00'-10.25'		BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 10.0	665
15	5	60	15.00'-15.50'			660
20	6	22-22-34	20.00'-21.17'		BOTTOM OF BORING @ 21.5 21.5	655
25						650
30						645
35						

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. **B-9**

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 676.0 | HOLE NO. B-10

GROUND WATER OBSERVATIONS
AT 6.5 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS		ELEV.
0	1	1-2-2-3	0.00'-2.00'		TOPSOIL		
					LIGHT BR.FINE-MED.SAND, LITTLE SILT	0.75	675
	2	7-10-10-13	2.00'-4.00'				
					GREY/BR.FINE-MED.SAND, LITTLE SILT	3.0	
	3	12-18-19-13	4.00'-6.00'				
5					GREY FINE-CRS.SAND, LITTLE SILT, TRACE GRAVEL	5.5	670
10	4	9-12-14	10.00'-11.50'		GREY FINE-CRS.SAND, SOME SILT, LITTLE GRAVEL, FEW COBBLES	10.0	665
15	5	22-32-29	15.00'-16.50'				660
20	6	51-60	20.00'-20.58'		BOTTOM OF BORING @ 20.6'	20.6	655
25							650
30							645
35							

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-10

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
TOWN OF ELLINGTON

PROJECT NAME
ADDITION TO CRYSTAL LAKE SCHOOL
LOCATION
284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 683.0
HOLE NO. B-11

GROUND WATER OBSERVATIONS
AT 4.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-1-5-3	0.00'-2.00'		TOPSOIL 0.56	
					BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL & ROOTS 2.0	
	2	7-33-60	2.00'-3.33'		LIGHT BR.FINE-CRS.SAND, SOME GRAVEL, TRACE SILT 3.0	680
					GREY/BR.FINE-CRS.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES	
	3	10-16-20	4.00'-5.50'			
5						675
10	4	5-12-16	10.00'-11.50'			
						670
15	5	16-36-60	15.00'-16.42'			
						665
20	6	45-60	20.00'-21.00'			
					WEATHERED ROCK 22.0	
					BOTTOM OF BORING @ 22.5' (AUGER REFUSAL) 22.5	660
25						
						655
30						
						650
35						

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-11

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.	OFFSET	SURFACE ELEV. 693.0	HOLE NO. B-12
TYPE	HSA		SS		LINE & STA.	GROUND WATER OBSERVATIONS	START DATE 12/26/12
SIZE I.D.	3.75"		1.375"		N. COORDINATE	AT 4.7 FT. AFTER 0 HOURS	
HAMMER WT.			140lbs		E. COORDINATE	AT FT. AFTER HOURS	FINISH DATE 12/26/12
HAMMER FALL			30"				

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-1-1-1	0.00'-2.00'		TOPSOIL 0.50	
					BR.SILT AND FINE-MED.SAND 1.5	
	2	11-23-29-60	2.00'-3.83'		BR.FINE-MED.SAND, SOME SILT, LITTLE GRAVEL, FEW COBBLES	690
5	3	21-23-25-23	5.00'-7.00'		GREY/BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL 5.0	685
10	4	17-26-32	10.00'-11.50'			680
					BOTTOM OF BORING @ 14.0' (AUGER REFUSAL) 14.0	
15						675
20						670
25						665
30						660
35						

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. **B-12**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
TOWN OF ELLINGTON

PROJECT NAME
ADDITION TO CRYSTAL LAKE SCHOOL
LOCATION
284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 674.5
HOLE NO. B-13
GROUND WATER OBSERVATIONS
AT 7.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS
START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	2-3-6-6	0.00'-2.00'		TOPSOIL 0.50	
					BR.FINE-CRS.SAND, LITTLE GRAVEL, TRACE SILT	
	2	13-12-14-28	2.00'-3.83'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL 2.0	
5	3	22-29-40-44	5.00'-7.00'			670
10	4	3-4-7	10.00'-11.50'			665
15	5	14-21-36	15.00'-16.50'			660
20	6	27-57-47	20.00'-21.50'		GREY/BR. FINE-CRS.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES 20.5	655
25	7	37-60	25.00'-25.58'		BOTTOM OF BORING @ 25.6' 25.6	650
30						645
35						640

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-13

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 689.0 | HOLE NO. B-14

GROUND WATER OBSERVATIONS
AT 8.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	5-6-7-9	0.00'-2.00'		TOPSOIL 0.33	
					LIGHT BR.FINE-MED.SAND, LITTLE SILT, TRACE ASPHALT - FILL 1.5	
	2	11-60	2.00'-3.00'		GREY FINE-CRS.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES	685
5	3	8-12-14	5.00'-6.50'		GREY FINE-MED.SAND, SOME SILT, LITTLE GRAVEL 5.0	
						680
10	4	60	10.00'-10.00'		GREY/BR. FINE-MED.SAND, SOME SILT, LITTLE GRAVEL, FEW COBBLES & BOULDERS 10.0	
						675
15	5	25-60	15.00'-15.92'			
						670
20	6	18-23-60	20.00'-21.42'		BOTTOM OF BORING @ 21.4' 21.4	
						665
25						
						660
30						
						655
35						

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: T. CZMYR
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-14

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
TOWN OF ELLINGTON

PROJECT NAME
ADDITION TO CRYSTAL LAKE SCHOOL
LOCATION
284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 685.8
HOLE NO. B-15

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/28/12
FINISH DATE 12/28/12

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					ASPHALT 0.17	
	1	6-10-12-15	1.00'-3.00'		BR.FINE-CRS.SAND, LITTLE SILT & GRAVEL	685
	2	20-17-20-21	2.00'-4.00'		GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL, FEW COBBLES 2.0	
5	3	30-30-60	5.00'-6.50'			680
10	4	28-30-42	10.00'-11.50'			675
15	5	60	15.00'-15.50'			670
20	6	60	20.00'-20.33'		BOTTOM OF BORING @ 20.4' 20.4	665
25						660
30						655
35						

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:

SHEET 1 OF 1 | HOLE NO. **B-15**

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE				
SIZE I.D.				
HAMMER WT.				
HAMMER FALL				

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. TP-1

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					TOPSOIL	
					BR.FINE-MED.SAND, SOME SILT, LITTLE ROOTS, FEW COBBLES — 1.0	
					GREY/BR.FINE-CRS.SAND, LITTLE SILT & GRAVEL, FEW COBBLES & BOULDERS — 3.0	
5						
					BOTTOM OF TEST PIT @ 8.5' — 8.5	
10						
15						
20						
25						
30						
35						

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:
INSPECTOR: M. WELTI

SHEET 1 OF 1 | HOLE NO. **TP-1**

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT TOWN OF ELLINGTON	PROJECT NAME ADDITION TO CRYSTAL LAKE SCHOOL LOCATION 284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE				
SIZE I.D.				
HAMMER WT.				
HAMMER FALL				

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.

HOLE NO. TP-2

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					TOPSOIL	
					BR.FINE SAND AND SILT, TRACE ROOTS — 2.0	
					GREY/BR.FINE-CRS.SAND, LITTLE SILT & GRAVEL — 3.5	
5					GREY FINE-MED.SAND, SOME SILT, TRACE GRAVEL — 5.0	
					BOTTOM OF TEST PIT @ 8.0' — 8.0	
					NOTE: SOILS WERE SATURATED BELOW 6 FEET	
10						
15						
20						
25						
30						
35						

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:
INSPECTOR: M. WELTI

SHEET 1 OF 1 | HOLE NO. **TP-2**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
TOWN OF ELLINGTON

PROJECT NAME
ADDITION TO CRYSTAL LAKE SCHOOL
LOCATION
284 SANDY BEACH ROAD, ELLINGTON, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE				
SIZE I.D.				
HAMMER WT.				
HAMMER FALL				

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. TP-3

GROUND WATER OBSERVATIONS
AT 3.5 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 12/26/12
FINISH DATE 12/26/12

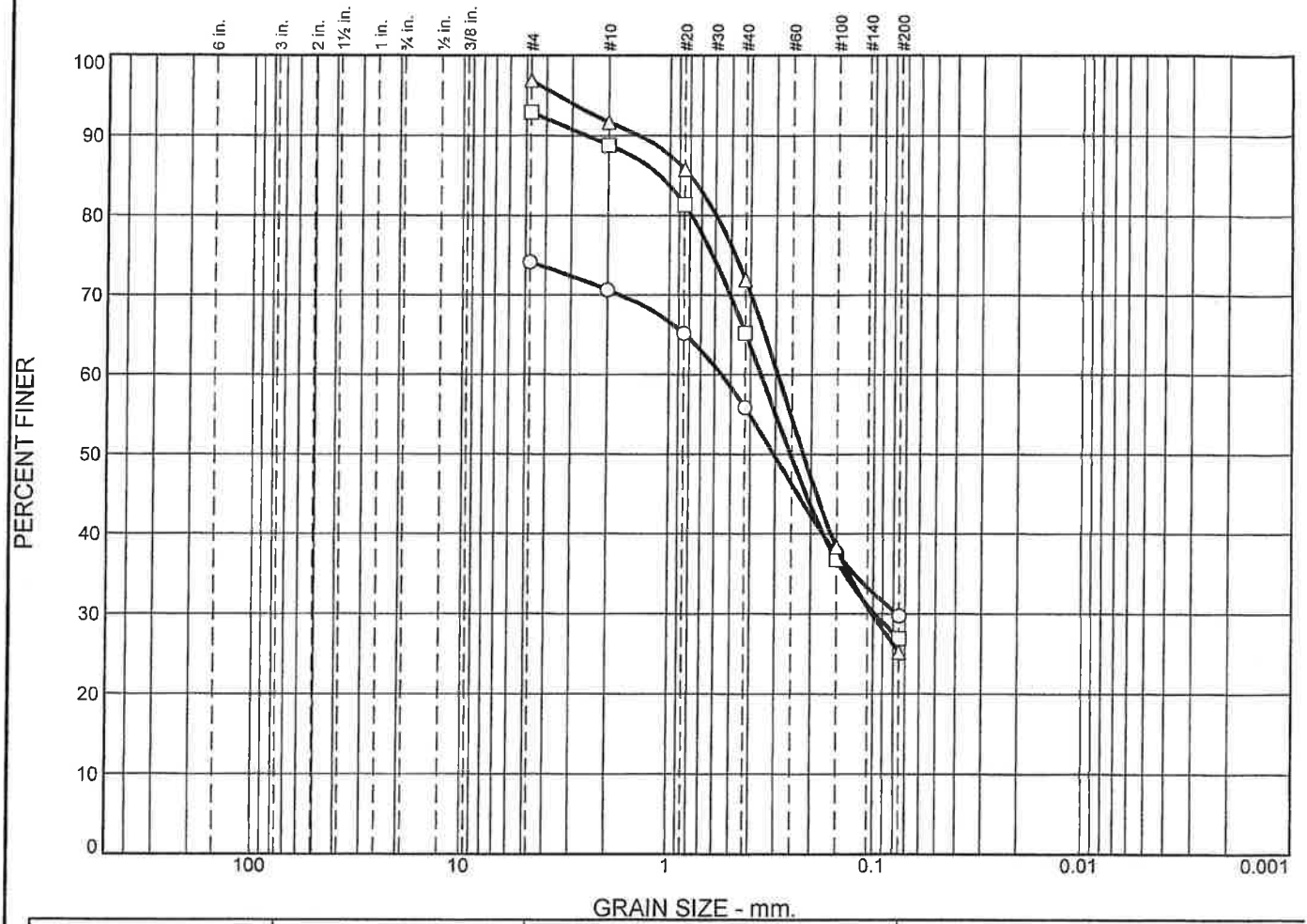
DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					TOPSOIL	
					BR.FINE-MED.SAND, SOME SILT, TRACE ROOTS — 1.0	
					GREY/BR.FINE-CRS.SAND, LITTLE SILT — 2.0	
					GREY/BR. FINE-MED.SAND, SOME SILT, LITTLE GRAVEL — 3.5	
5						
					BOTTOM OF TEST PIT @ 8.0' — 8.0	
					NOTE: GROUND WATER SEEPAGE INTO TEST PIT AT 3.5 FEET	
10						
15						
20						
25						
30						
35						

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:
INSPECTOR: M. WELTI

SHEET 1 OF 1 | HOLE NO. **TP-3**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				3.5	14.8	26.2	29.7	
□				4.1	23.6	38.3	26.9	
△				5.2	19.8	46.7	25.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○				0.5543	0.3057	0.0770				
□			1.1272	0.3551	0.2533	0.0977				
△			0.8027	0.2933	0.2195	0.1011				

	Material Description	USCS	AASHTO
○			
□			
△			

Project No. **Client:** TOWN OF ELLINGTON

Project: ADDITION TO CRYSTAL LAKE SCHOOL

○ **Source of Sample:** B-2 **Depth:** 0.56

□ **Source of Sample:** B-3 **Depth:** 2.0 **Sample Number:** 2

△ **Source of Sample:** B-4 **Depth:** 4.0 **Sample Number:** 3

Remarks:

○ water content = 11.1%

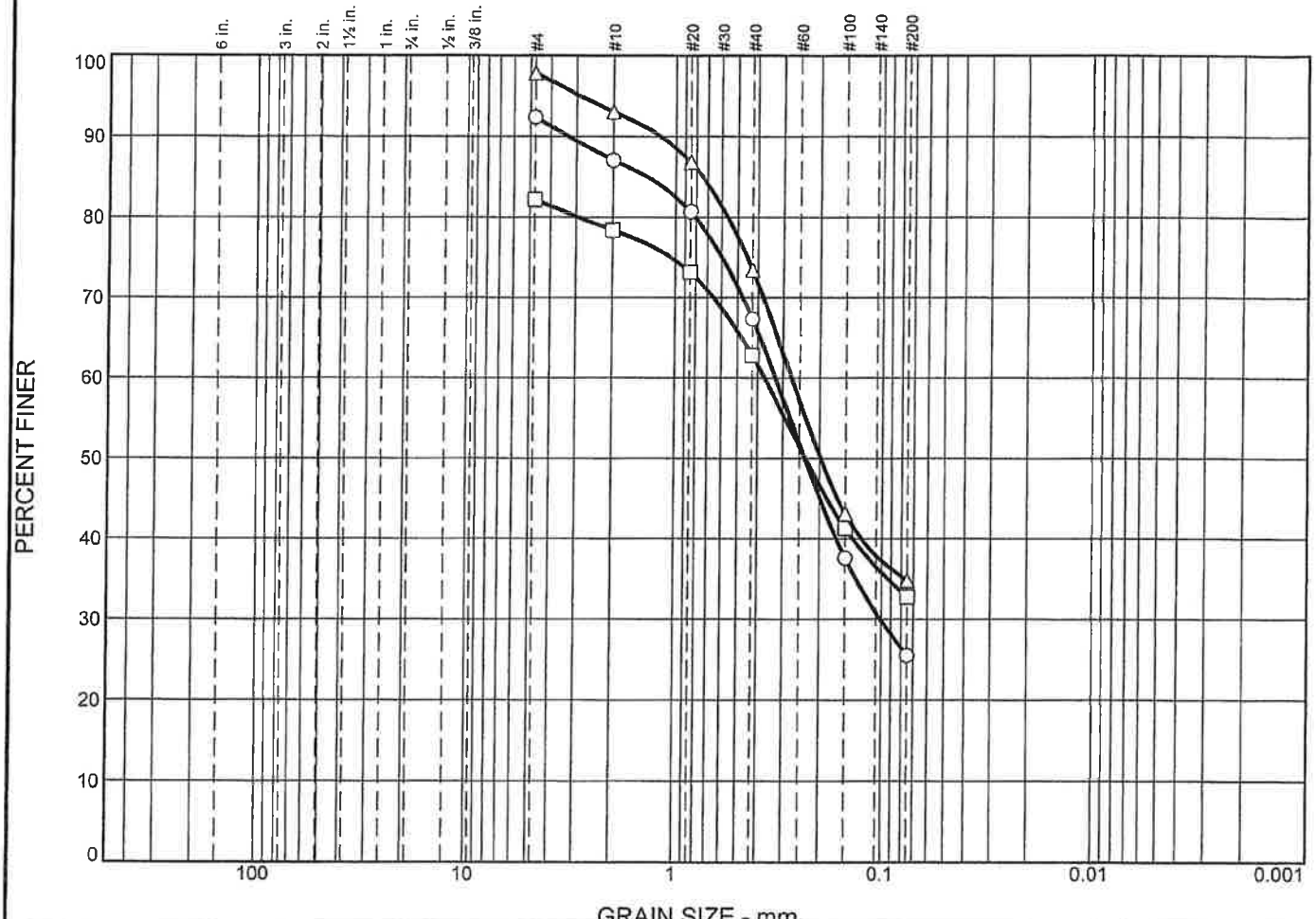
□ water content = 15.8%

△ water content = 8.3%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				5.4	19.7	41.8	25.5	
□				3.9	15.5	30.0	32.8	
△				4.8	19.6	38.6	34.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.3835	0.3275	0.2355	0.1009				
□				0.3703	0.2340					
△			0.7451	0.2737	0.1977					

	Material Description	USCS	AASHTO
○			
□			
△			

Project No. **Client:** TOWN OF ELLINGTON

Project: ADDITION TO CRYSTAL LAKE SCHOOL

○ **Source of Sample:** B-6 **Depth:** 4.0 **Sample Number:** 3

□ **Source of Sample:** B-7 **Depth:** 2.0 **Sample Number:** 2

△ **Source of Sample:** B-9 **Depth:** 2.0 **Sample Number:** 2

Remarks:

○ water content = 10.4%

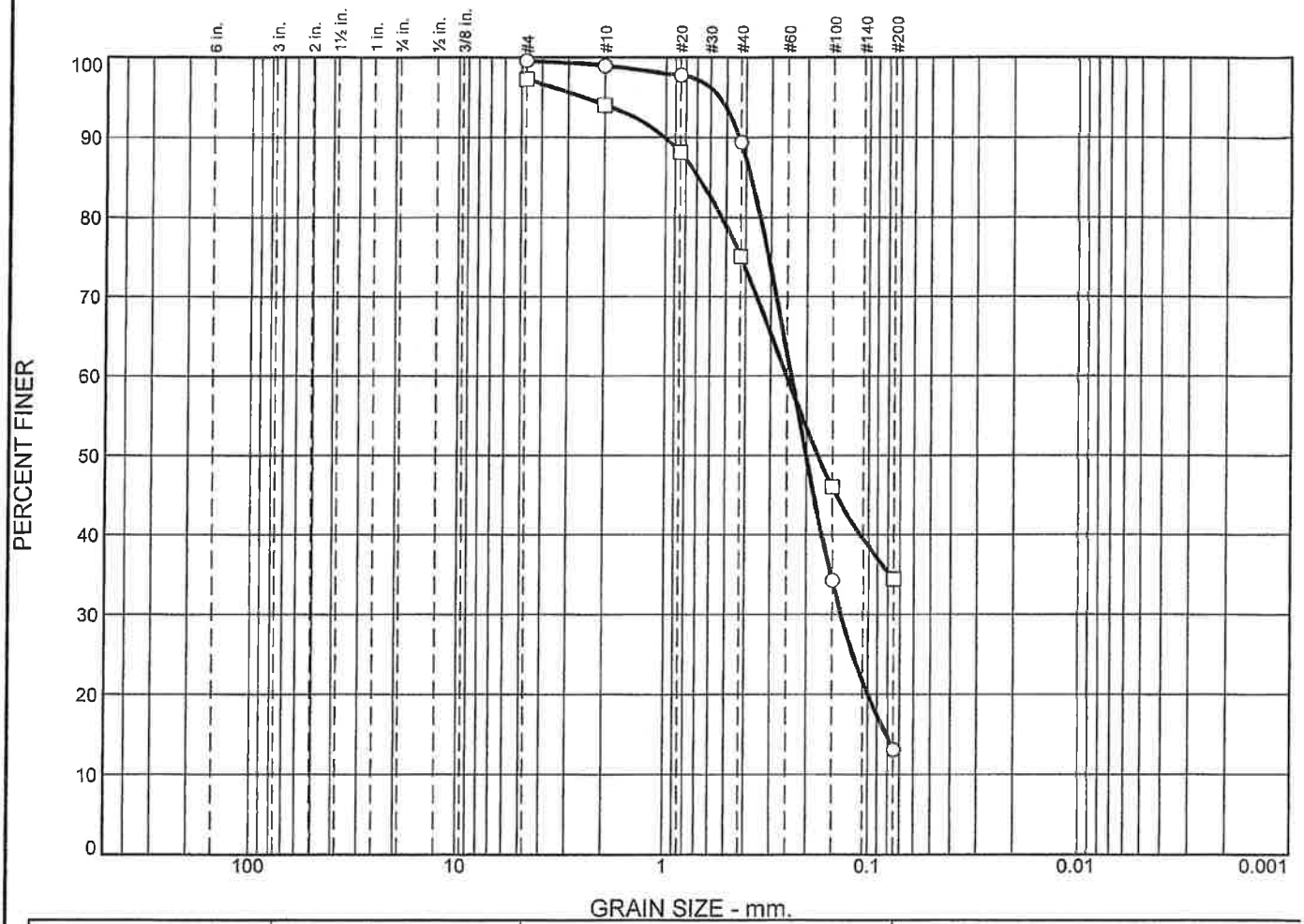
□ water content = 9.4%

△ water content = 15.6%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				0.6	9.6	76.3	13.1	
□				3.2	19.1	40.6	34.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3787	0.2383	0.2016	0.1358	0.0815			
□			0.6864	0.2511	0.1766					

	Material Description	USCS	AASHTO
○			
□			

Project No. **Client:** TOWN OF ELLINGTON

Project: ADDITION TO CRYSTAL LAKE SCHOOL

○ **Source of Sample:** B-10 **Depth:** 2.0 **Sample Number:** 2

□ **Source of Sample:** B-12 **Depth:** 2.0 **Sample Number:** 2

Remarks:

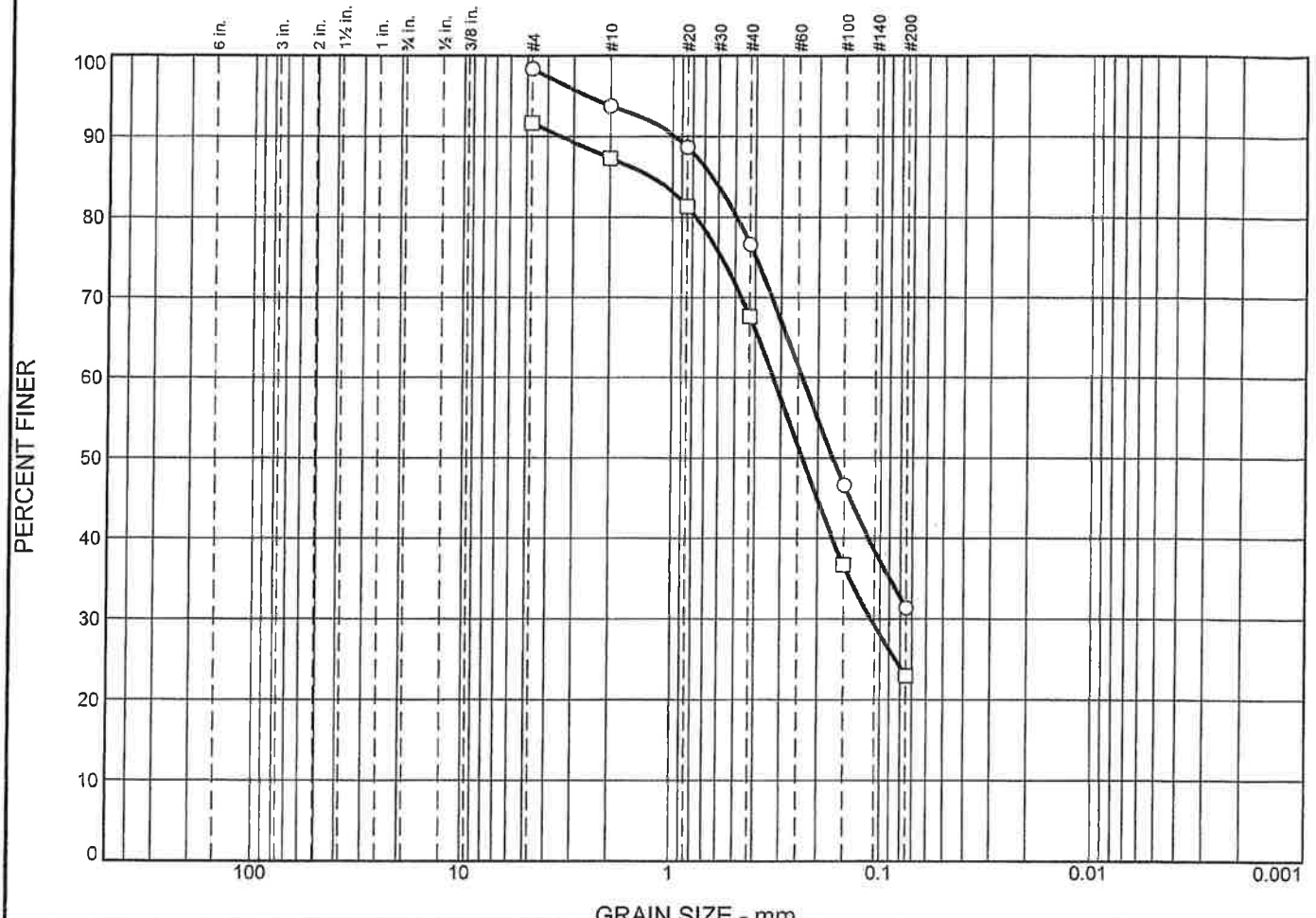
○ water content = 9.8%

□ water content = 9.8%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				4.7	17.1	45.2	31.4	
□				4.4	19.7	44.6	23.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.6450	0.2382	0.1701					
□			1.2638	0.3267	0.2373	0.1107				

	Material Description	USCS	AASHTO
○			
□			

Project No. **Client:** TOWN OF ELLINGTON

Project: ADDITION TO CRYSTAL LAKE SCHOOL

○ **Source of Sample:** B-14 **Depth:** 2.0 **Sample Number:** 2

□ **Source of Sample:** B-15 **Depth:** 1.0 **Sample Number:** 1

Remarks:

○ water content = 11.8%

□ water content = 8.5%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Ellington Crystal Lake

January 15, 2013

Schematic package list of drawings:

C1 – cover sheet

C-1.0 - proposed site plan

A1 – existing floor plan

A2 – demolition floor plan

A3 – proposed floor plan (B&W) with dimensions

A3 – proposed floor plans (photoshop)

A4 – existing elevations

A5 – existing elevations

A6 – proposed elevations (noted with materials)

A7 – proposed elevations (noted with materials)

A8 – proposed elevations (noted with materials)

A9 – proposed roof plan

A10 – enlarged floor plans

Rendered elevations (sketch up)

Rendered images (5) in photoshop

Phasing plans (photoshop)

Area plans (photoshop)

The Expansion and Renovate as New for the Crystal Lake Elementary School

100% Schematic Documents

State Project Number: 048-0058 EA/RR/PS

January 15, 2013

SILVER / PETRUCELLI + ASSOCIATES
Architects / Engineers / Interior Designers

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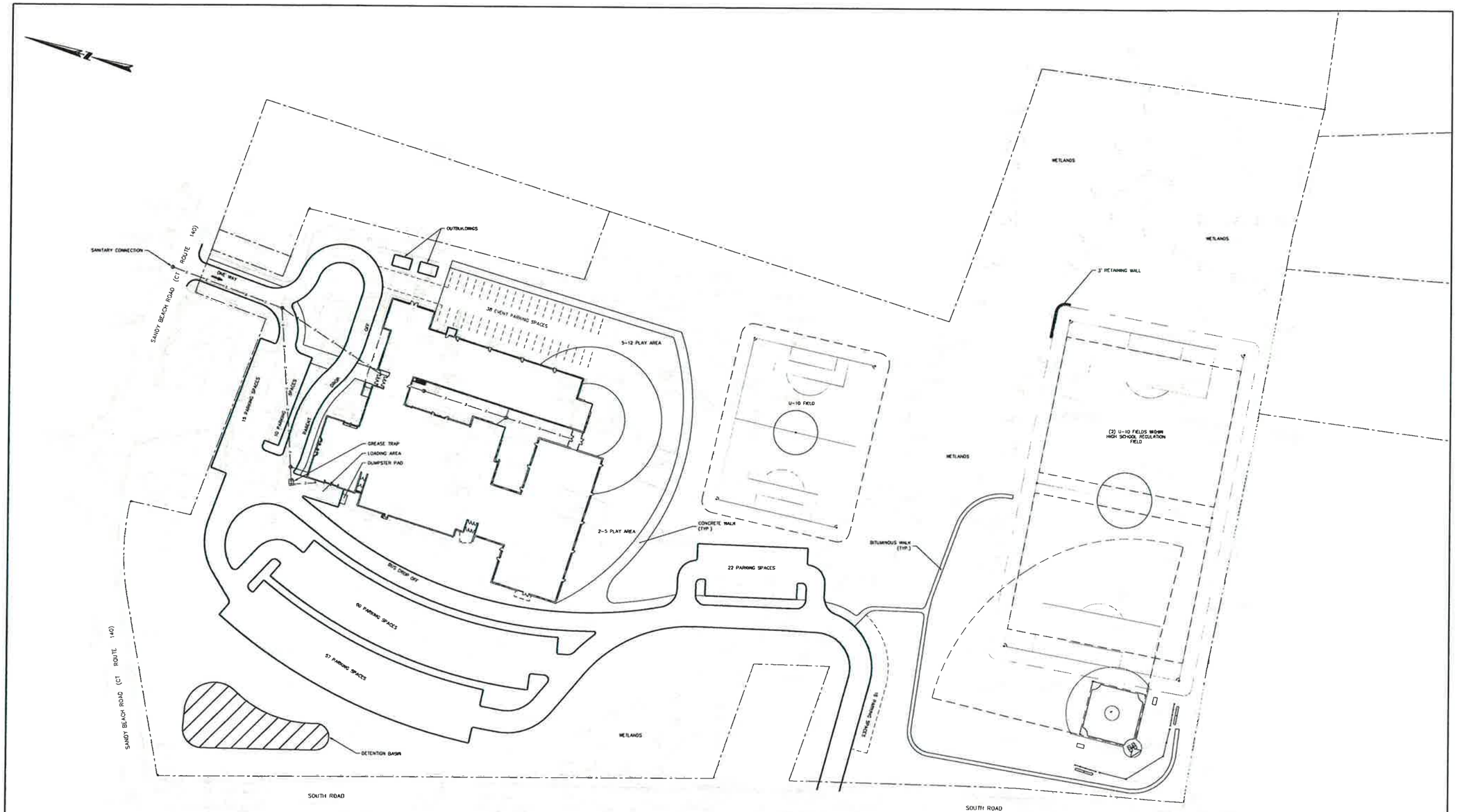

BSC GROUP
180 Glastonbury Boulevard
Suite 103
Glastonbury, Connecticut 06033
860 652 8227

Project Title
Additions , Alterations & Renovation to New
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut 06029

SILVER / PETRUCELLI + ASSOCIATES
Architects / Engineers / Interior Designers
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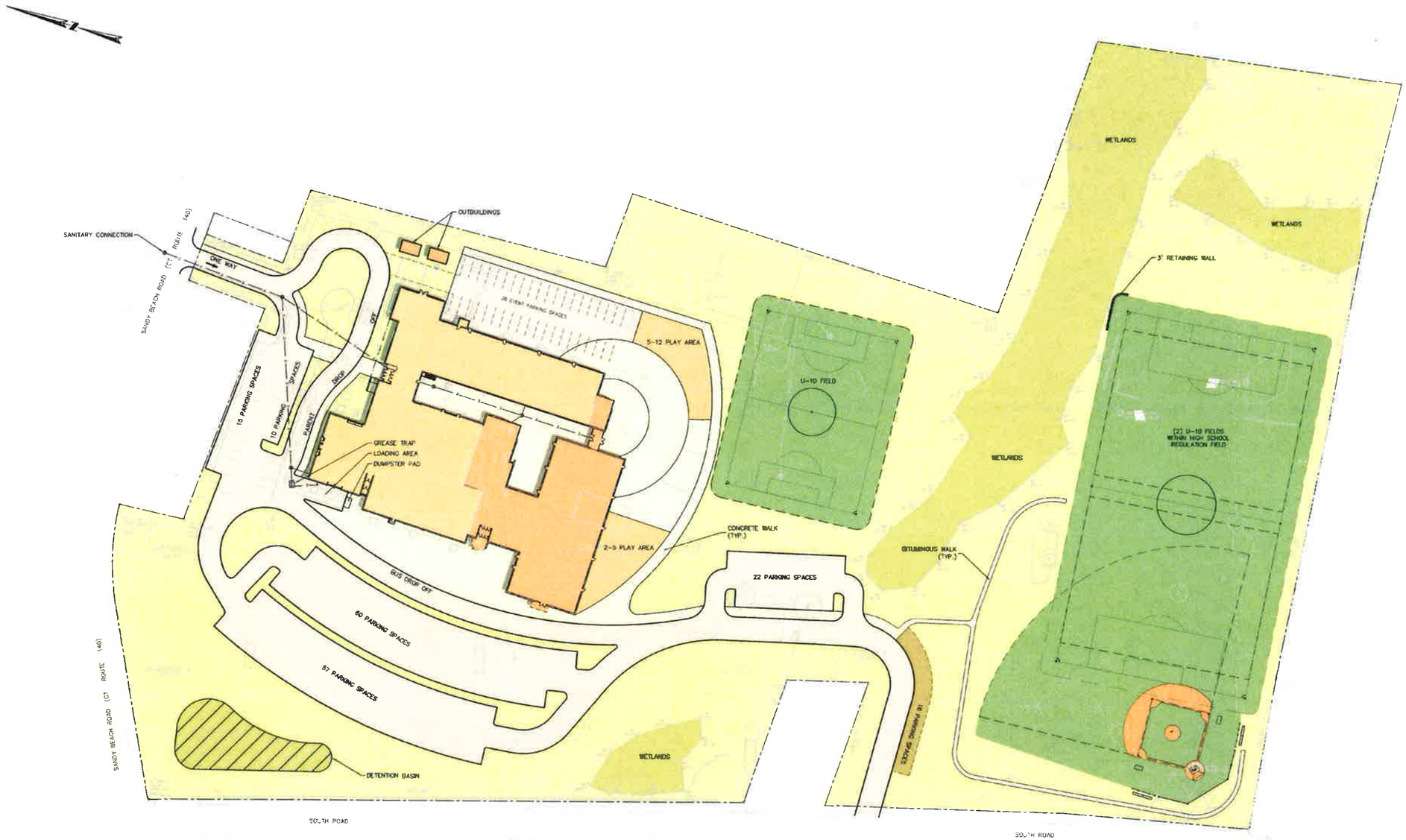
silverpetrucelli.com

Revisions	Description	Date	Revised By

Drawing Title
Schematic Site Plan

State Project Number 048-0058 EA/RR/PS

Date: January 15, 2013
Scale: 1" = 40'
Drawn By: egw
Project Number: 12140
Drawing Number: C-1.0



PARKING COUNT	
REGULAR -	142
EVENT -	38
FIELDS -	38
TOTAL -	218

SCALE IN FEET
80 40 0 80

BSC GROUP
180 Glastonbury Boulevard
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Glastonbury, Connecticut 06033
860 652 8227

Project Title
Additions , Alterations & Renovation to New
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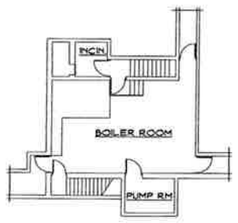
Revision	Description	Date	Revised By

Drawing Title
Schematic Site Rendering
State Project Number 048-0058 EA/RR/PS

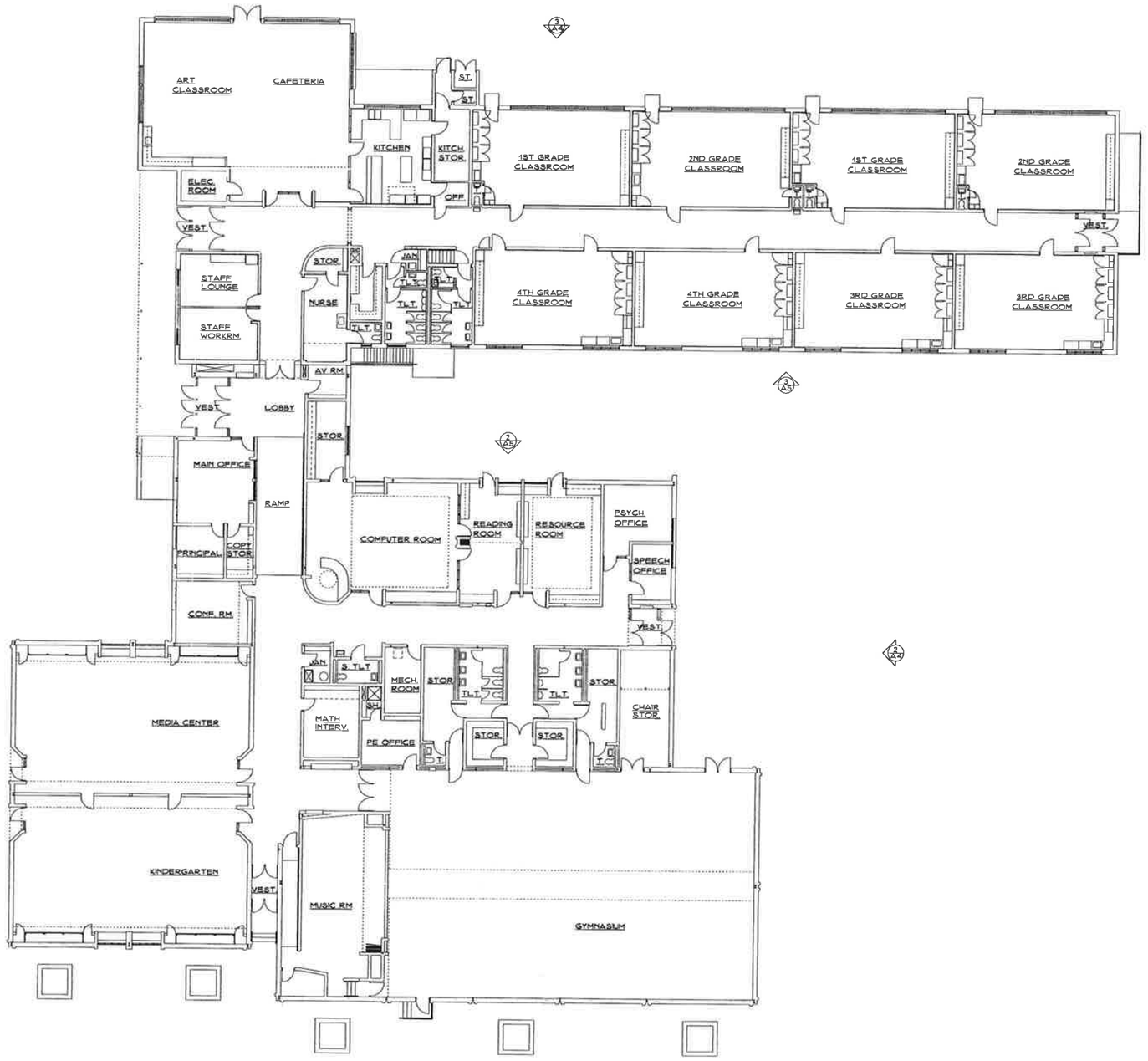
Date: January 15, 2013
Scale: 1" = 40'
Drawn By: MJP
Project Number: 12.140

Drawing Number: C-1.0



EXISTING BOILER ROOM

SCALE: NONE



EXISTING FLOOR PLAN

SCALE: NONE

Project Title:
Additions , Alterations & Renovation to New
Crystal Lake Elementary School
284 Sandy Beach Road
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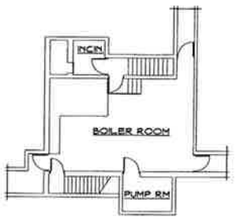
Revisions:	Description:	Date:	Revised By:

Drawing Title:
Existing Floor Plan

State Project Number 048-0058 EA/RR/PS

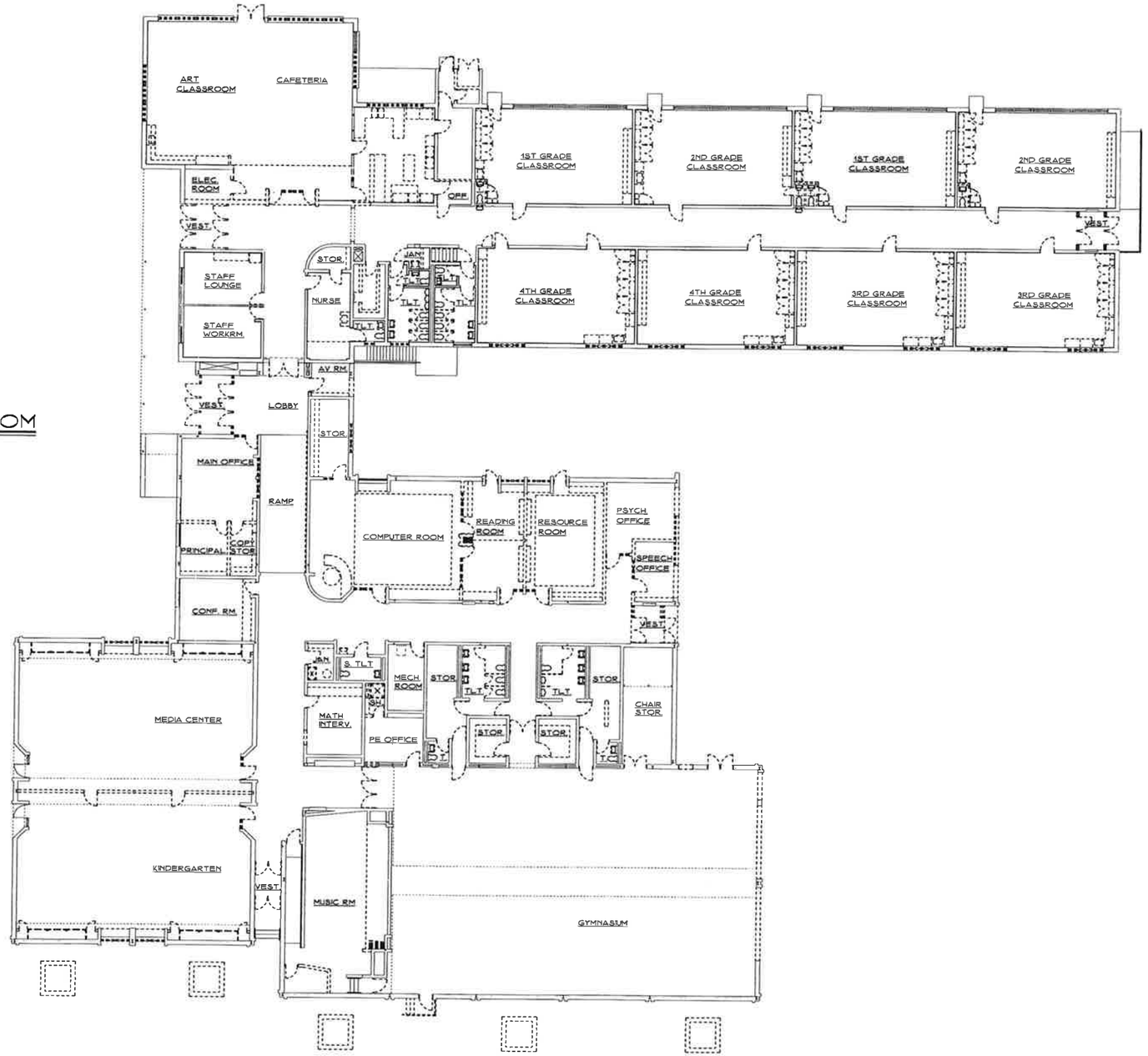
Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 12-140

Drawing Number: **A1**



PROPOSED BOILER ROOM

SCALE: NONE



PROPOSED DEMOLITION FLOOR PLAN

SCALE: NONE

DEMO. NOTES

1. REMOVE ALL FLOORING MATERIAL
2. REMOVE ALL CEILINGS
3. REMOVE ALL LIGHT FIXTURES
4. REMOVE ALL MECH SYSTEMS
5. REMOVE ALL PLUMBING FIXTURES
6. REMOVE ALL EXTERIOR WINDOWS
7. REMOVE ALL INTERIOR DOORS & HARD
8. REMOVE ALL INTERIOR CASEWORK
8. REMOVE ALL INTERIOR CASEWORK

Project Title:
Additions , Alterations & Renovation to New
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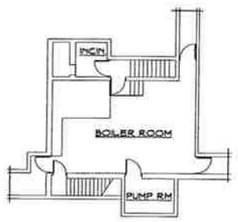
Revision:	Description:	Date:	Revised By:

Drawing Title:
Proposed Demolition Floor Plan
State Project Number 048-0058 EA/RR/PS

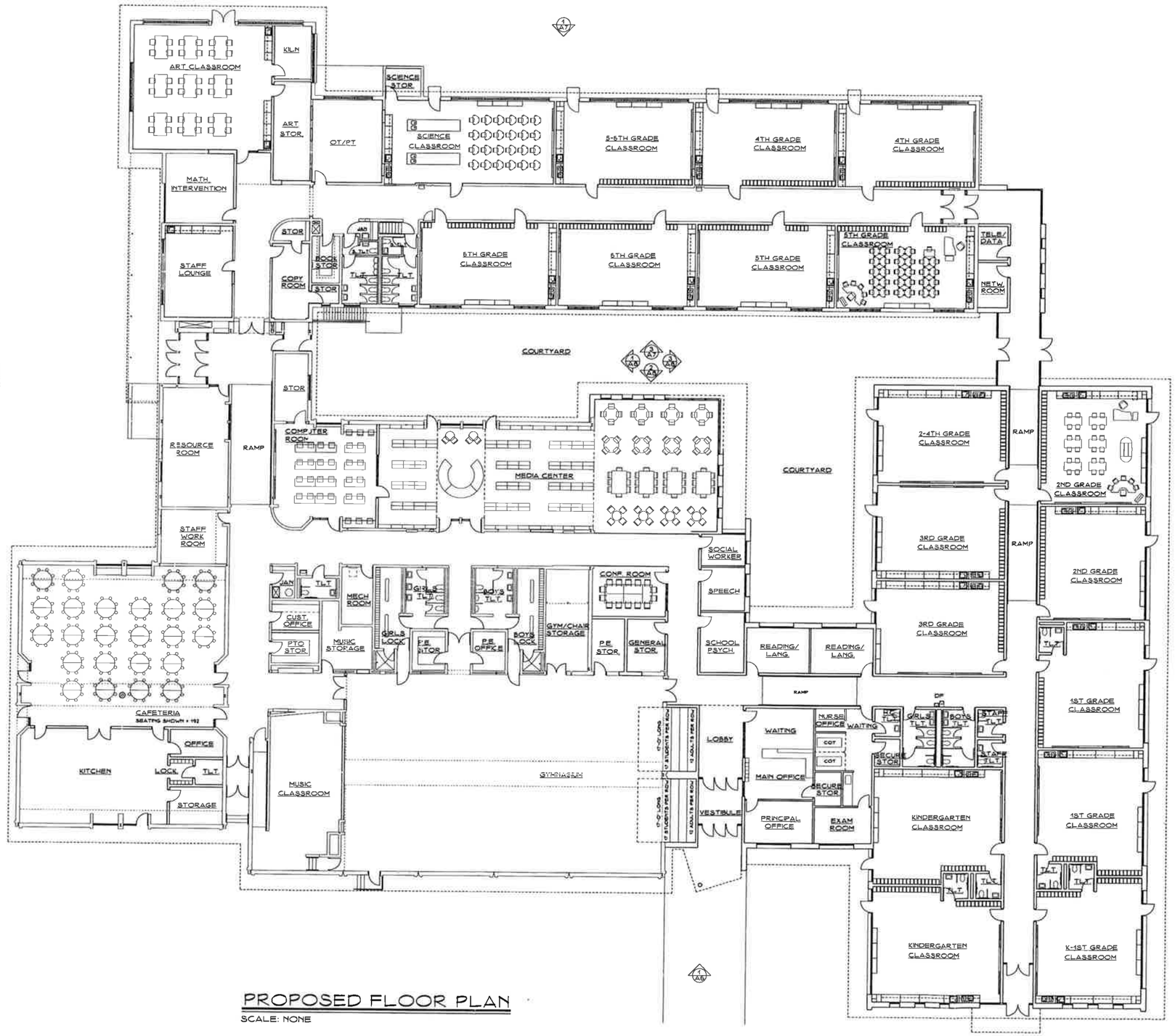
Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 1214C

Drawing Number: **A2**



PROPOSED BOILER ROOM

SCALE: NONE



PROPOSED FLOOR PLAN

SCALE: NONE

Project Title:
Additions , Alterations & Renovation to New
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut 06029

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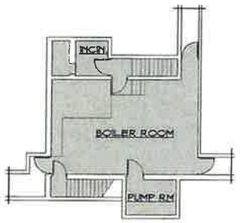
Revisions:	Description:	Date:	Revised By:

Drawing Title:
Proposed Floor Plan
State Project Number 048-0058 EA/RR/PS

Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 12.140

Drawing Number: **A3**



PROPOSED BOILER ROOM

SCALE: NONE

PROPOSED FLOOR PLAN

SCALE: NONE

Project Title

Additions , Alterations & Renovation to New

Crystal Lake Elementary School

284 Sandy Beach Road
Ellington, Connecticut 06029

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No./mm/dd	Description	Date	Revised By

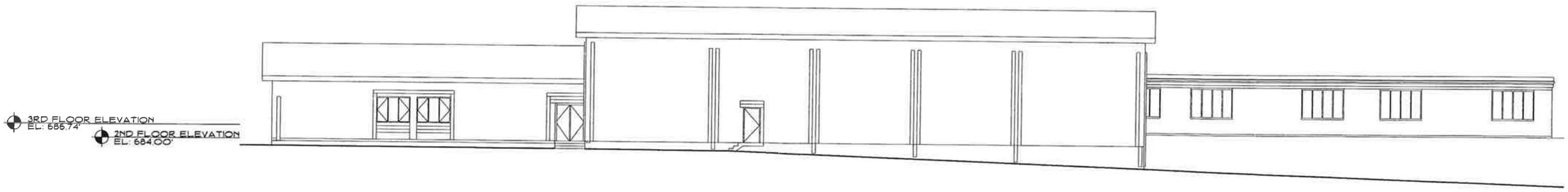
Drawing Title

Proposed Floor Plan

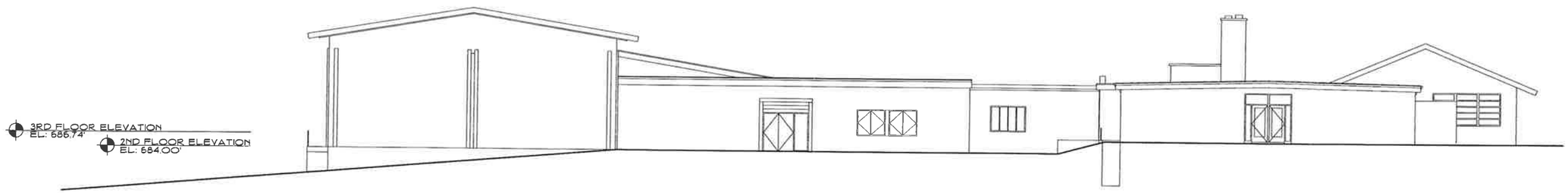
State Project Number 048-0058 EA/RR/PS

Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 12.140

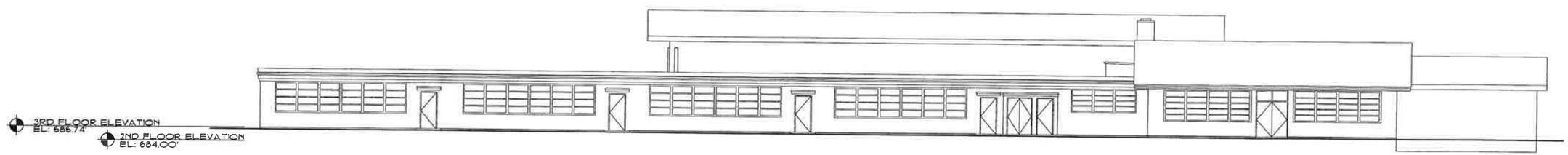
Drawing Number: A3



EXISTING WEST ELEVATION (1/A4)
SCALE: 1/8" = 1'-0"



EXISTING SOUTH ELEVATION (2/A4)
SCALE: 1/8" = 1'-0"



EXISTING EAST ELEVATION (3/A4)
SCALE: 1/8" = 1'-0"

Project Title:
Addition and Renovations to
Crystal Lake School
Sandy Beach Road
Ellington, Connecticut 06029

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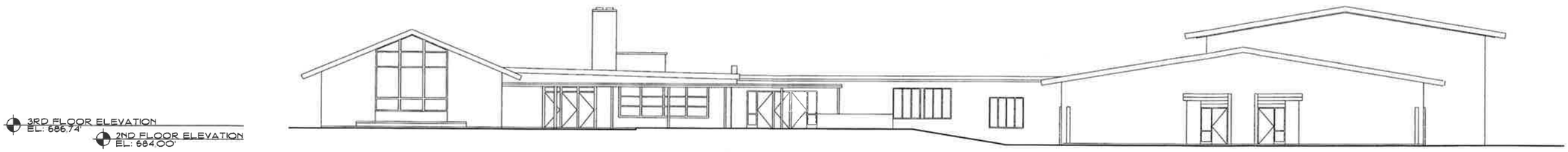
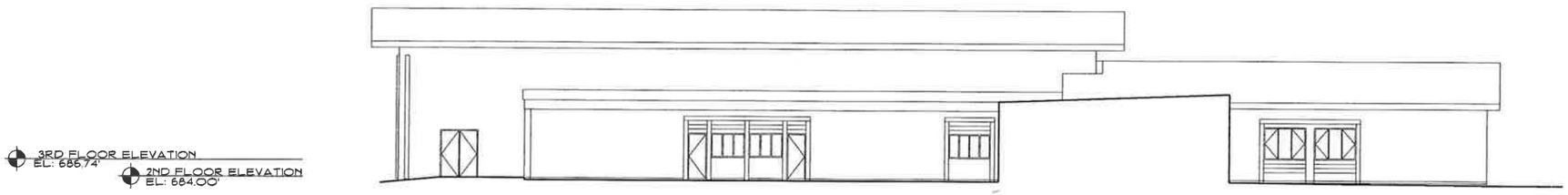
Revision:	Description:	Date:	Revised By:

Drawing Title:
Existing Elevations

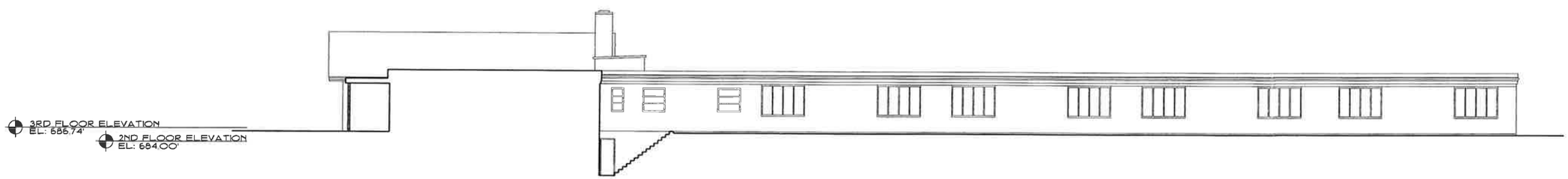
Date: JANUARY 15 2013
Scale: 1/8"= 1'-0"
Drawn By:
Project Number: 12.14O
Drawing Number: A4



EXISTING NORTH ELEVATION (1/A5)
SCALE: 1/8" = 1'-0"



EXISTING EAST ELEVATION- COURTYARD (2/A5)
SCALE: 1/8" = 1'-0"



EXISTING WEST ELEVATION- COURTYARD (3/A5)
SCALE: 1/8" = 1'-0"

Project Title:
Addition and Renovations to
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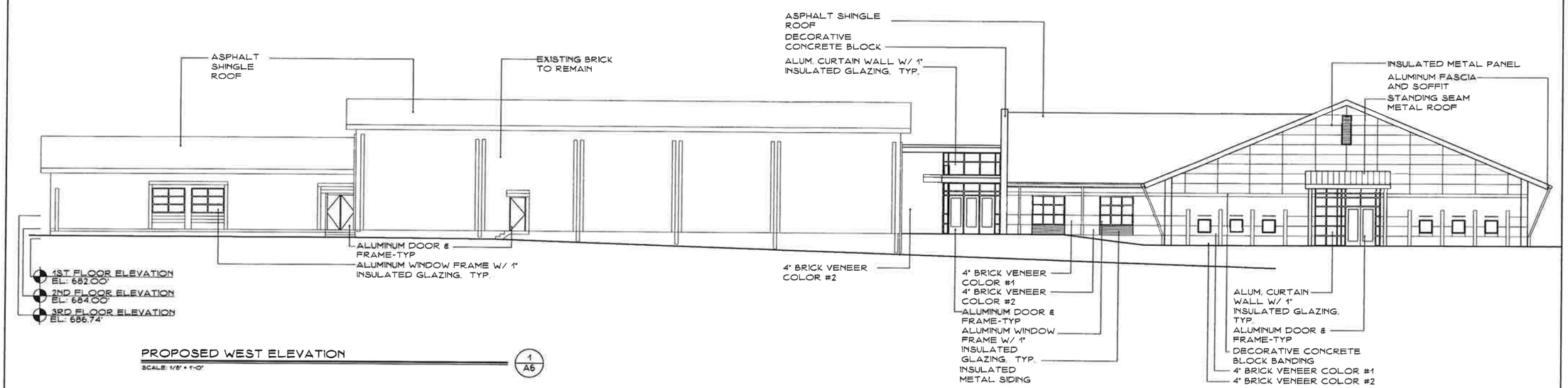
Revision:	Description:	Date:	Revised By:

Drawing Title: Existing Elevations

Date: JANUARY 15 2013
Scale: 1/8"= 1'-0"
Drawn By:
Project Number: 12140

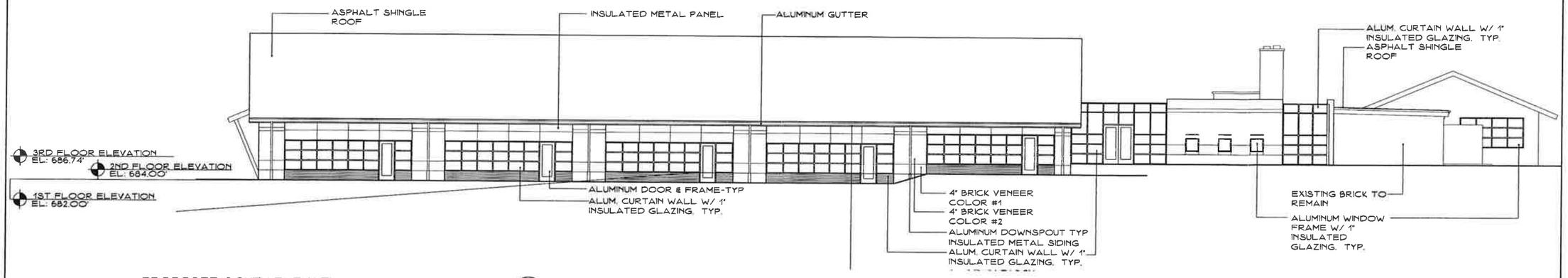
Drawing Number: A5



PROPOSED WEST ELEVATION

SCALE: 1/8" = 1'-0"

1 / A6



PROPOSED SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

2 / A6

Project Title:
Addition, Alterations and Renovations to New
Crystal Lake School
284 Sandy Beach Road
Ellington, Connecticut 06029

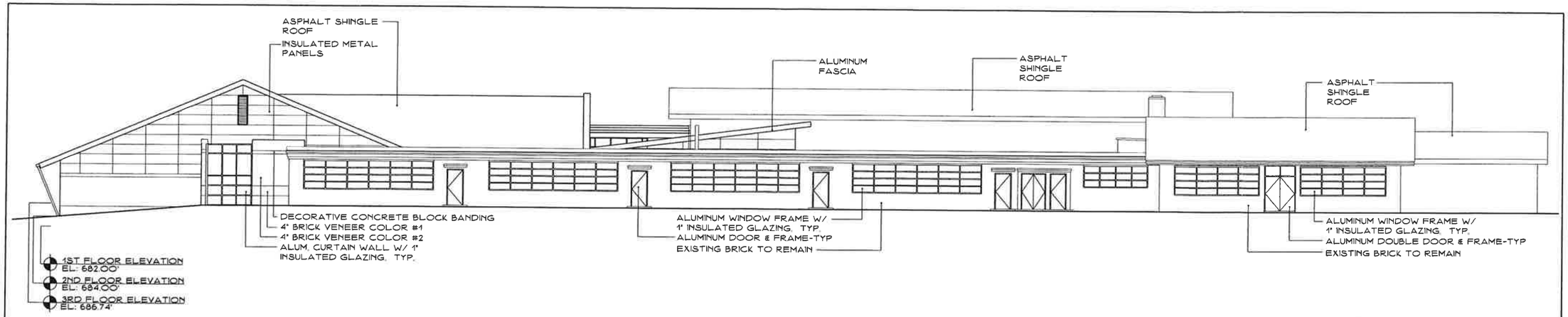
SILVER / PETRUCELLI + ASSOCIATES
Architects / Engineers / Interior Designers
3190 Whitney Avenue, Hamden, CT 06518-2340
Tel. 203 230 9007 Fax. 203 230 8247
silverpetrucelli.com

Revision:	Description:	Date:	Revised By:

Drawing Title:
Proposed Elevations

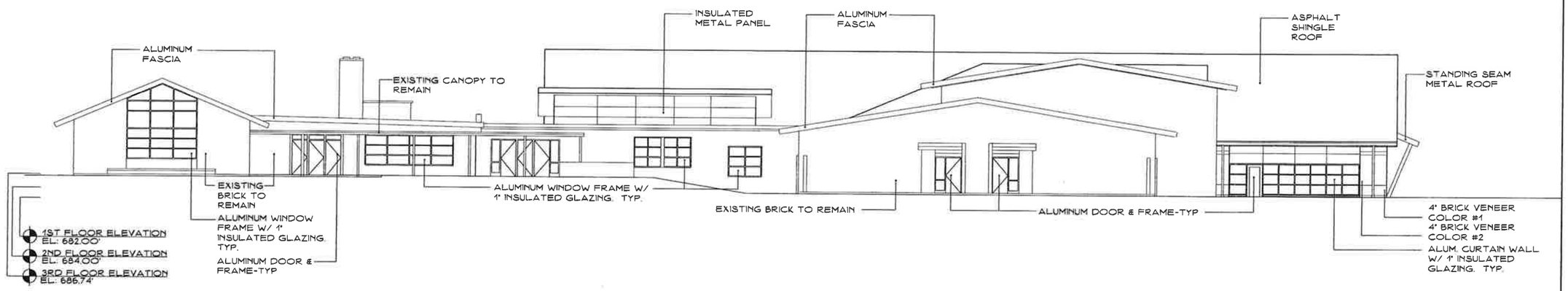
Date: JANUARY 15 2013
Scale: 1/8"= 1'-0"
Drawn By: ARJACKSON
Project Number: 12-140

Drawing Number: A6



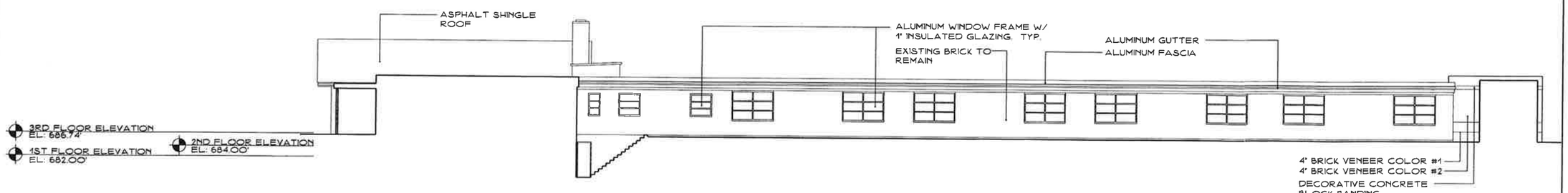
PROPOSED EAST ELEVATION — 1/A7

SCALE: 1/8" = 1'-0"



PROPOSED EAST ELEVATION — 2/A7

SCALE: 1/8" = 1'-0"



PROPOSED WEST COURTYARD ELEVATION — 3/A7

SCALE: 1/8" = 1'-0"

Project Title:

Addition, Alterations and Renovations to New

Crystal Lake School

284 Sandy Beach Road
Ellington, Connecticut 06029

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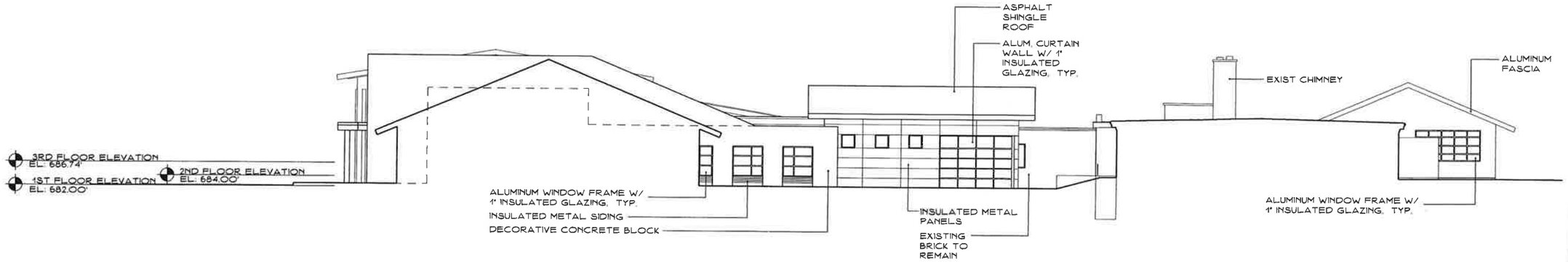
silverpetrucelli.com

Revision:	Description:	Date:	Revised By:

Drawing Title:

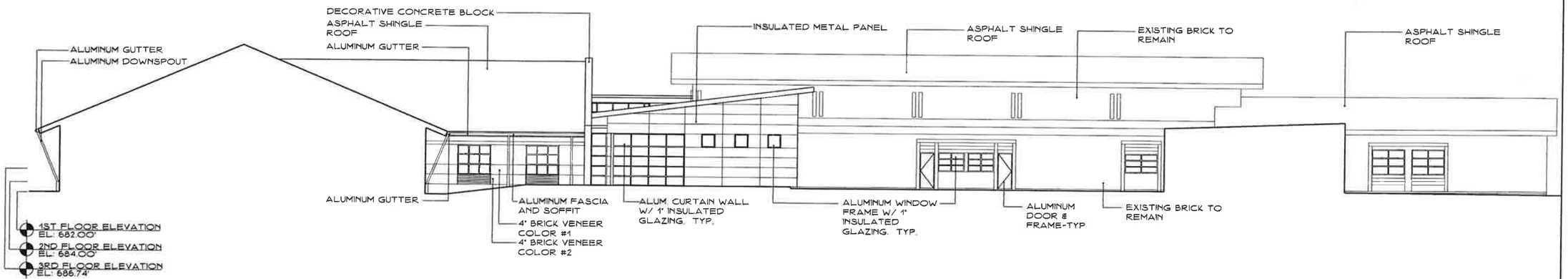
Proposed Elevations

Date: JANUARY 15 2013
Scale: 1/8"= 1'-0"
Drawn By: AR-JACKSON
Project Number: 12.140
Drawing Number: A7



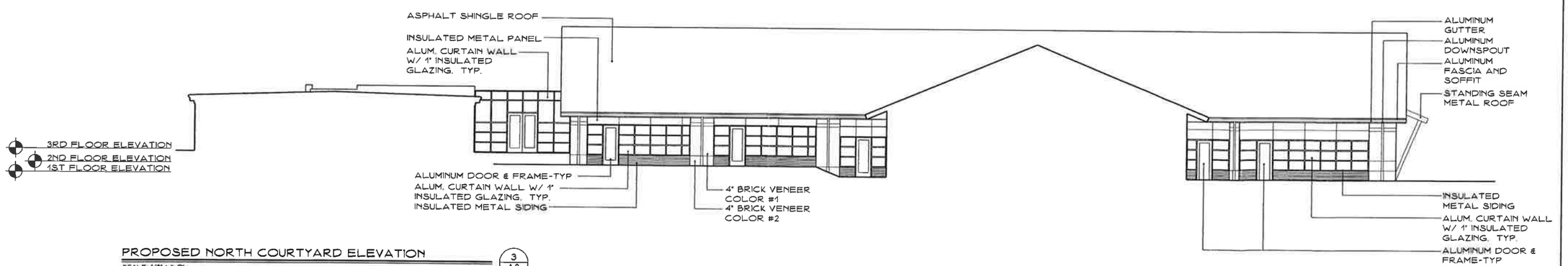
PROPOSED SOUTH COURTYARD ELEVATION — 1/A8

SCALE: 1/8" = 1'-0"



PROPOSED EAST COURTYARD ELEVATION — 2/A8

SCALE: 1/8" = 1'-0"



PROPOSED NORTH COURTYARD ELEVATION — 3/A8

SCALE: 1/8" = 1'-0"

Project Title:

Addition, Alterations and Renovations to New

Crystal Lake School

284 Sandy Beach Road
Ellington, Connecticut 06029

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Architects / Engineers / Interior Designers
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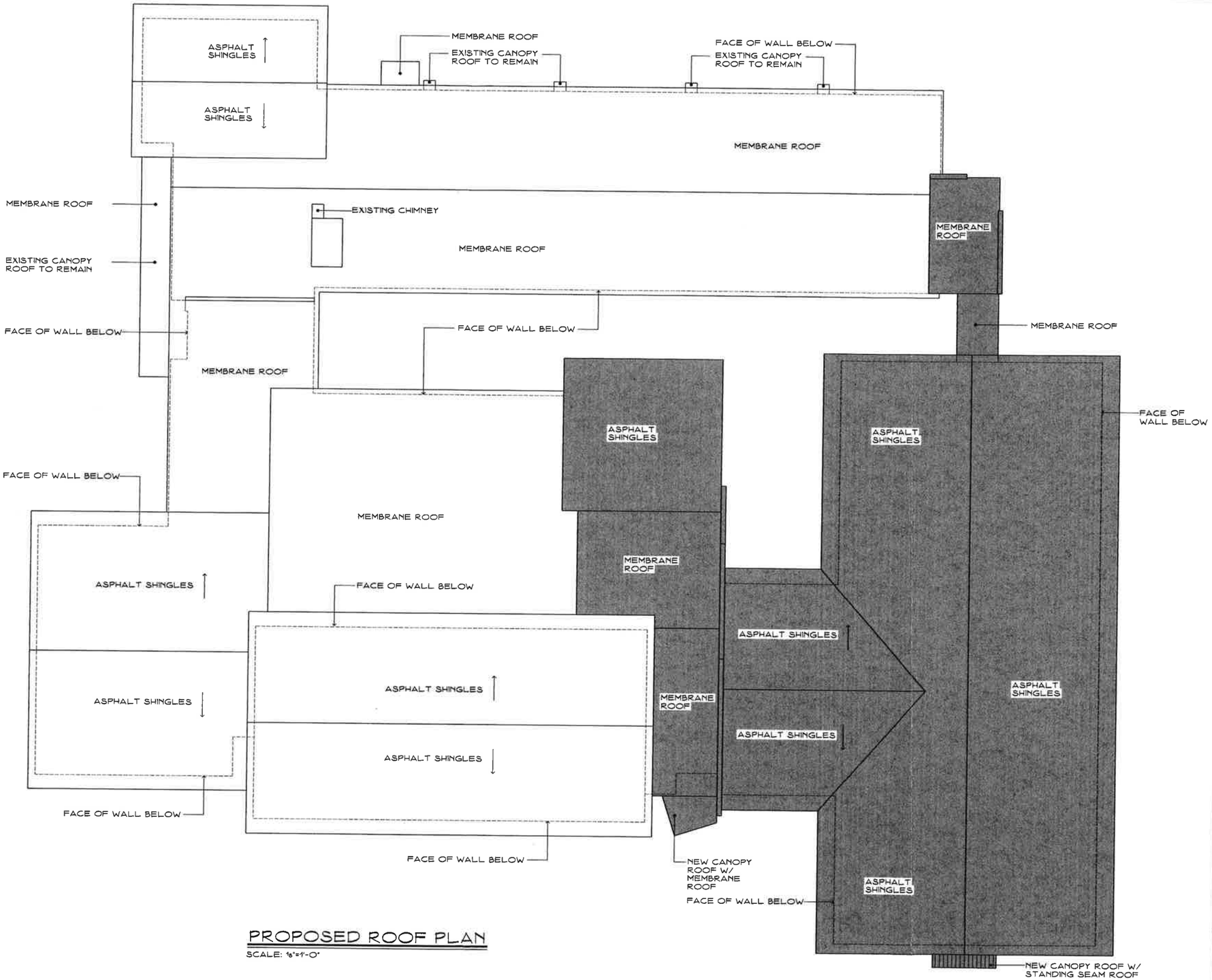
silverpetrucelli.com

Revision:	Description:	Date:	Revised By:

Drawing Title:

Proposed Elevations

Date: JANUARY 15 2013
Scale: 1/8" = 1'-0"
Drawn By: ARJACKSON
Project Number: 12.140
Drawing Number: A8



PROPOSED ROOF PLAN

SCALE: 1/8"=1'-0"

Project Title:
Additions , Alterations & Renovation to New
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut 06029

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3190 Whitney Avenue, Hamden, CT 06518-2340
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silverpetrucelli.com

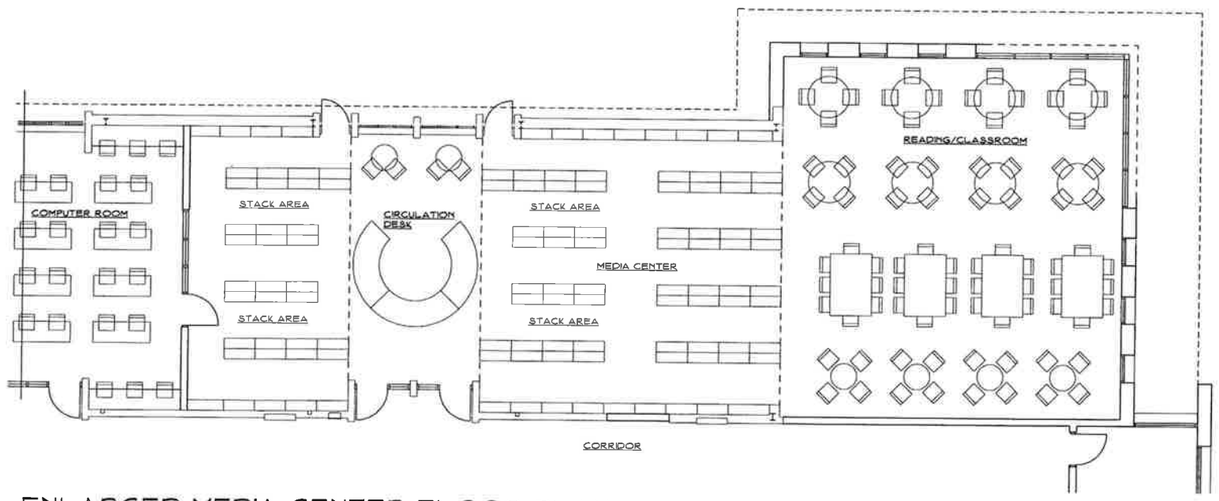
Revision:	Description:	Date:	Revised By:

Drawing Title:
Proposed Roof Plan

State Project Number 048-0058 EA/RR/PS

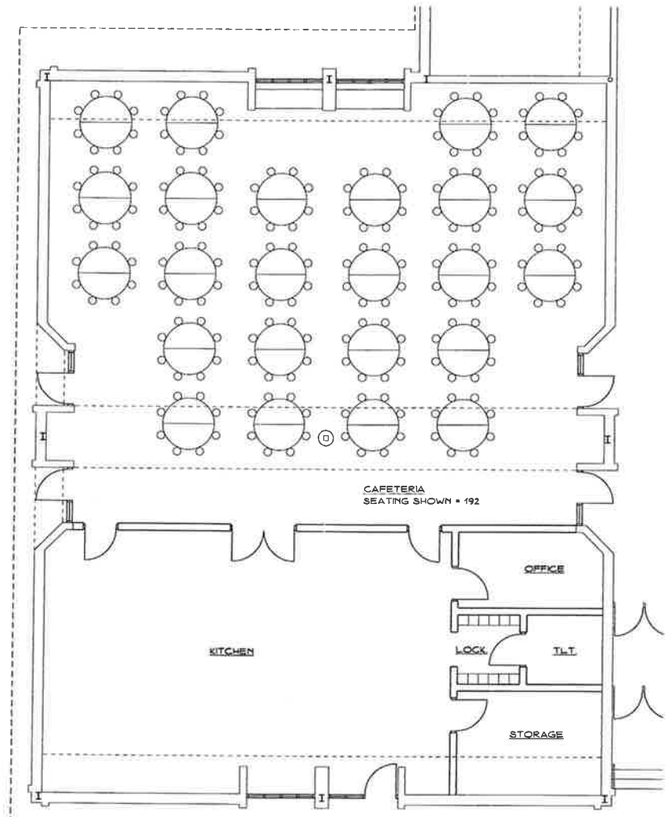
Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 12.14O

Drawing Number: **A9**



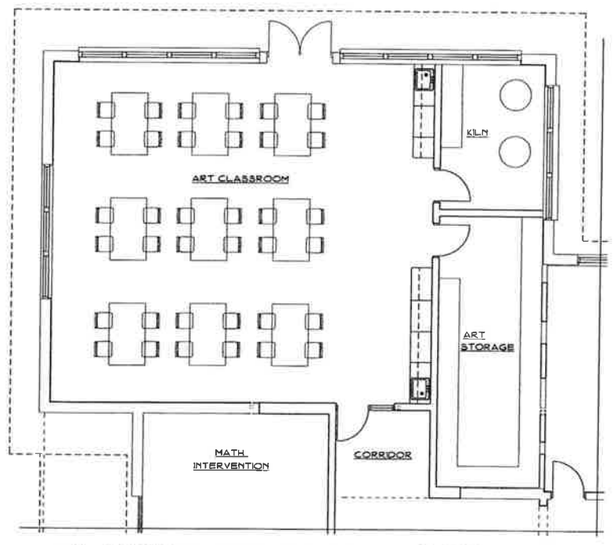
ENLARGED MEDIA CENTER FLOOR PLAN

SCALE: NONE



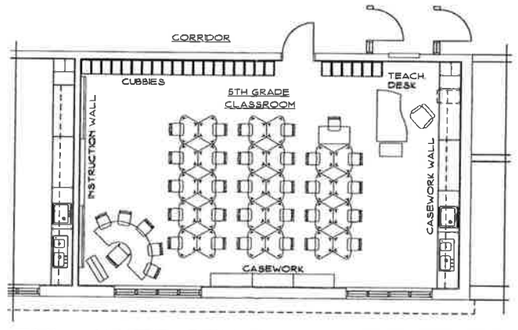
ENLARGED KITCHEN/CAFE FLOOR PLAN

SCALE: NONE



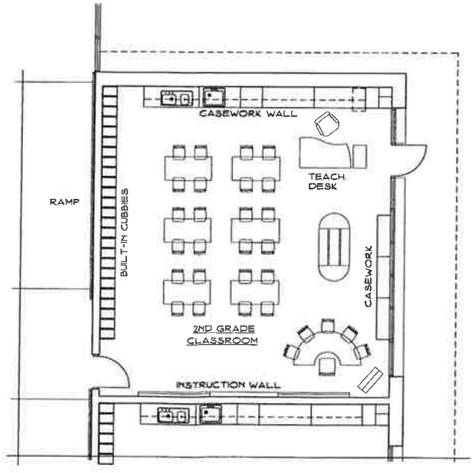
ENLARGED ART ROOM FLOOR PLAN

SCALE: NONE



ENLARGED 5TH GRADE C.R. FLOOR PLAN

SCALE: NONE



ENLARGED 2ND GRADE C.R. FLOOR PLAN

SCALE: NONE

Project Title:
Additions , Alterations & Renovation to New
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut 06029

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Architects / Engineers / Interior Designers
3190 Whitney Avenue, Hamden, CT 06518-2340
Tel. 203 230 9007 Fax. 203 230 8247
silverpetrucelli.com

Revision:	Description:	Date:	Revised By:

Drawing Title:
Enlarged Floor Plans

State Project Number 048-0058 EA/RR/PS

Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 12.140

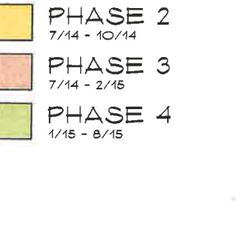
Drawing Number: **A10**

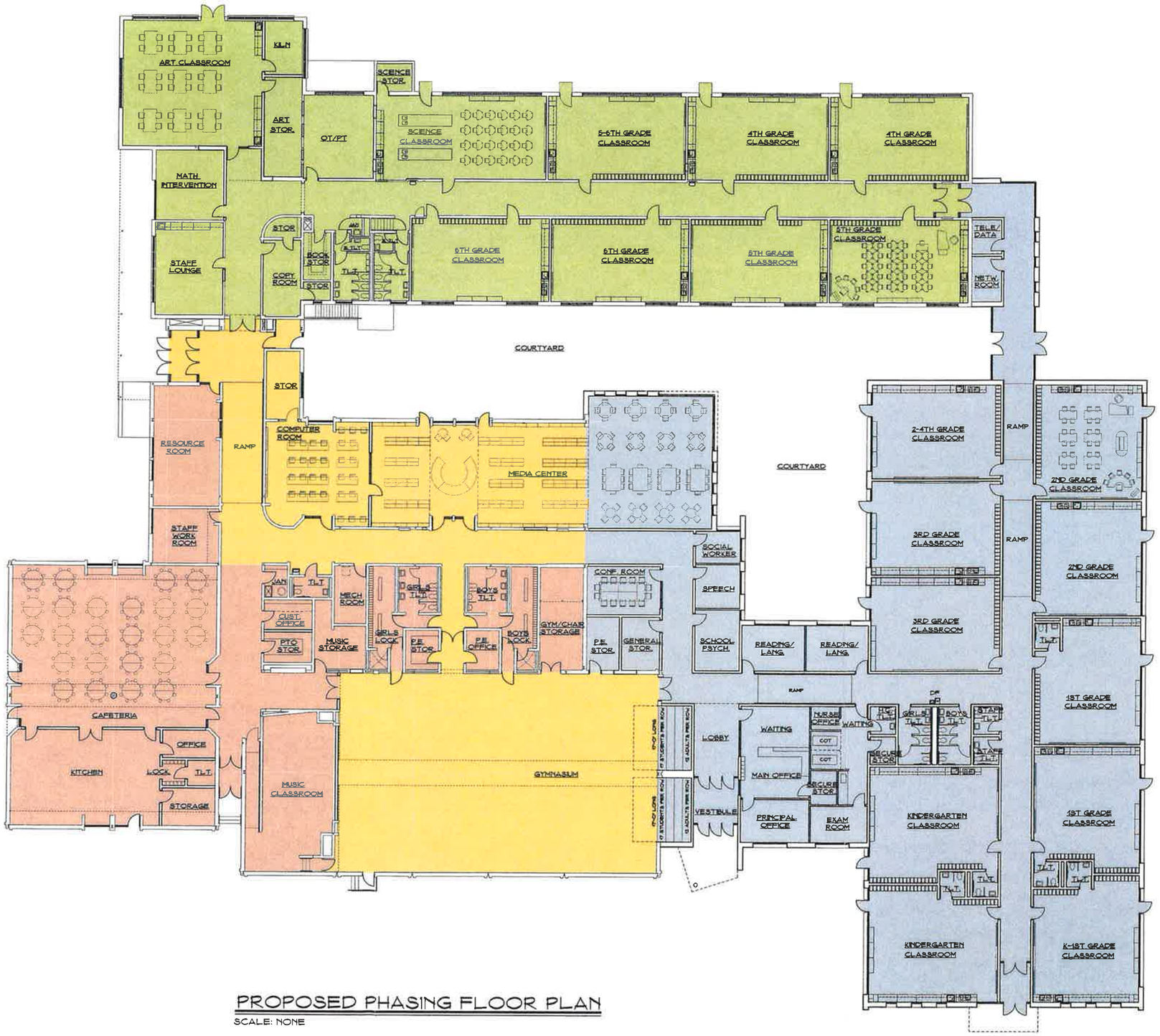
PHASE 1
9/13 - 8/14

PHASE 2
7/14 - 10/14

PHASE 3
7/14 - 2/15

PHASE 4
1/15 - 8/15





PROPOSED PHASING FLOOR PLAN

SCALE: NONE

Project Title
Additions , Alterations & Renovation to New
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut 06029

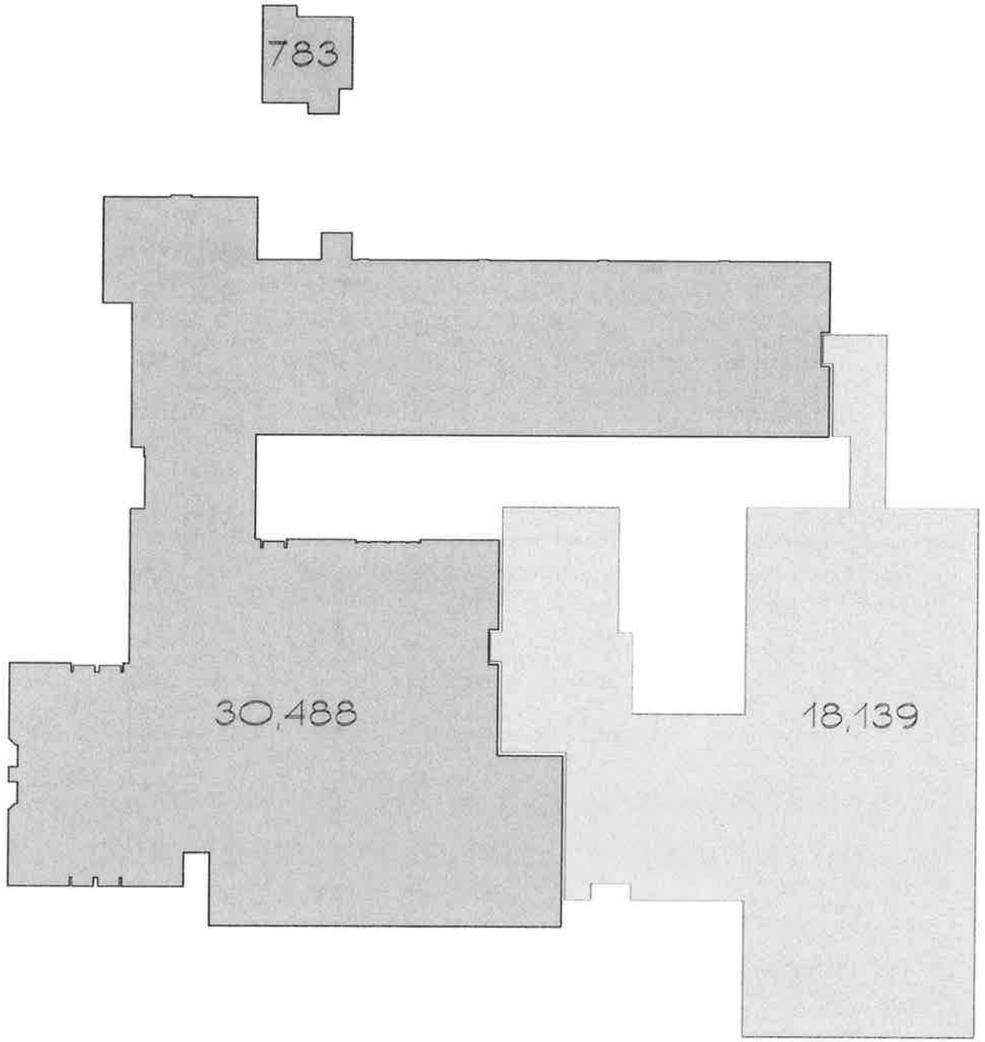
SILVER / PETRUCELLI + ASSOCIATES
Architects / Engineers / Interior Designers
3190 Whitney Avenue, Hamden, CT 06518-2340
Tel. 203 230 9007 Fax. 203 230 8247
silverpetrucelli.com

Revisions	Description	Date	Revised By

Drawing Title
Proposed Phasing Plan

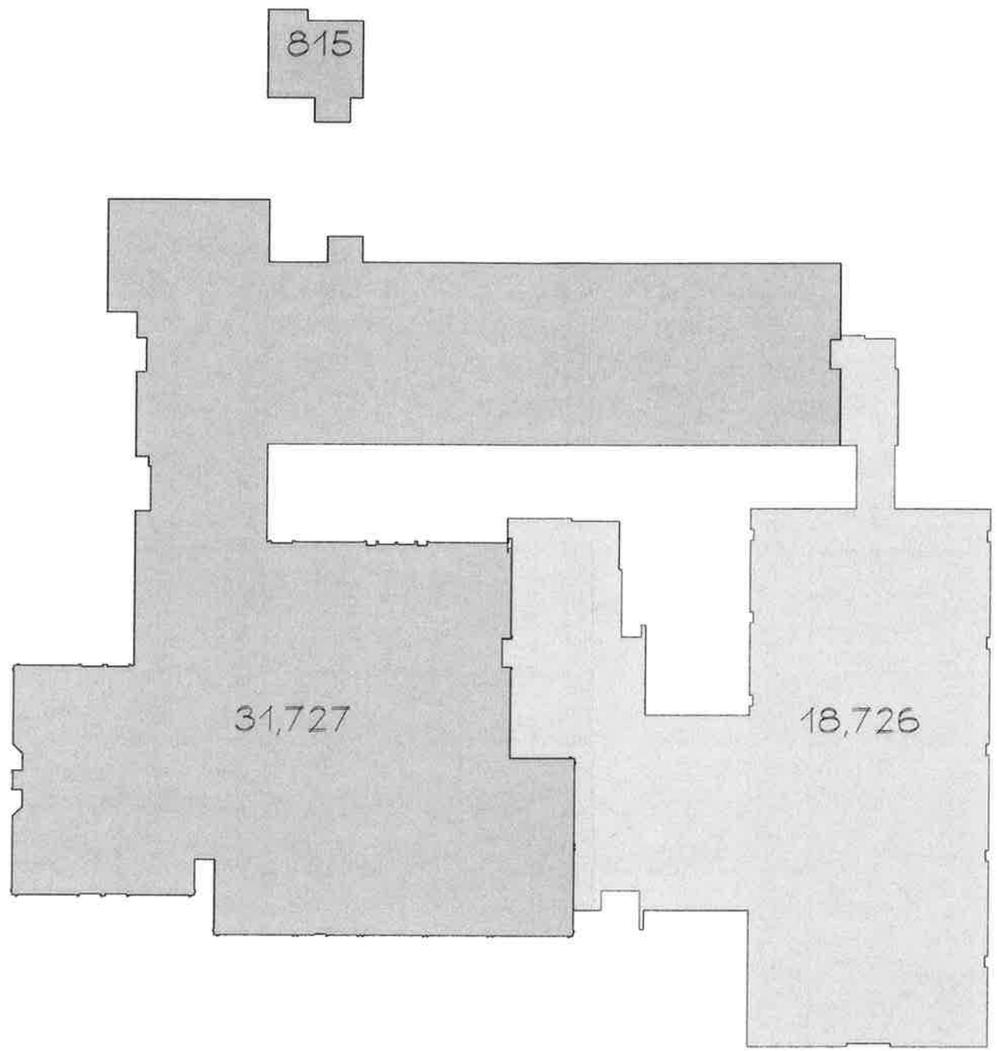
State Project Number 048-0058 EA/RR/PS

Date: JANUARY 15, 2013
Scale: NONE
Drawn By: D. A. PETRUCELLI
Project Number: 12.140
Drawing Number:



EXISING & PROPOSED NET FLOOR AREA

SCALE: NONE



EXISING & PROPOSED GROSS FLOOR AREA

SCALE: NONE

Project Title

Additions , Alterations & Renovation to New

Crystal Lake Elementary School

284 Sandy Beach Road

Ellington, Connecticut 06029

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Architects / Engineers / Interior Designers

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silverpetrucelli.com

Revision	Description	Date	Revised By

Drawing Title

Proposed Area Plans

State Project Number 048-0058 EA/RR/PS

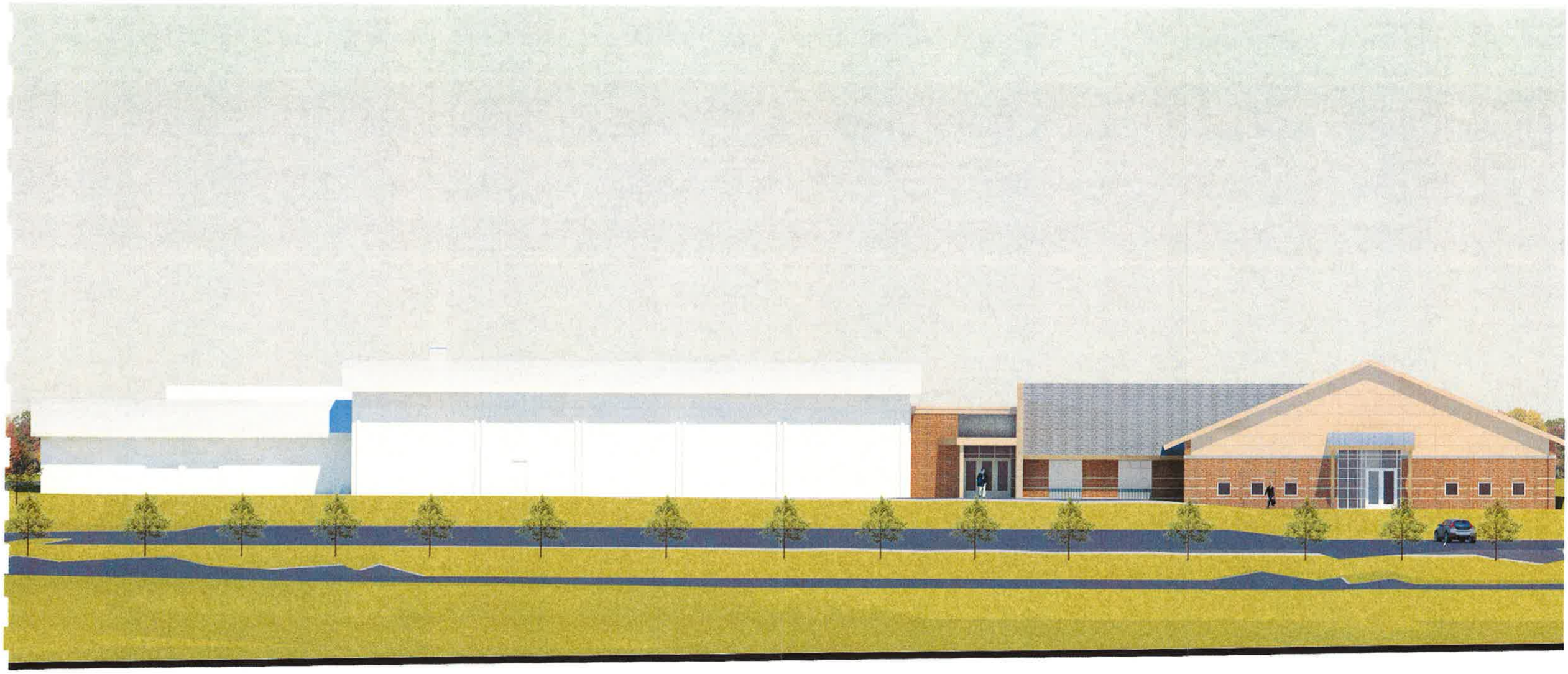
Date: JANUARY 15, 2018

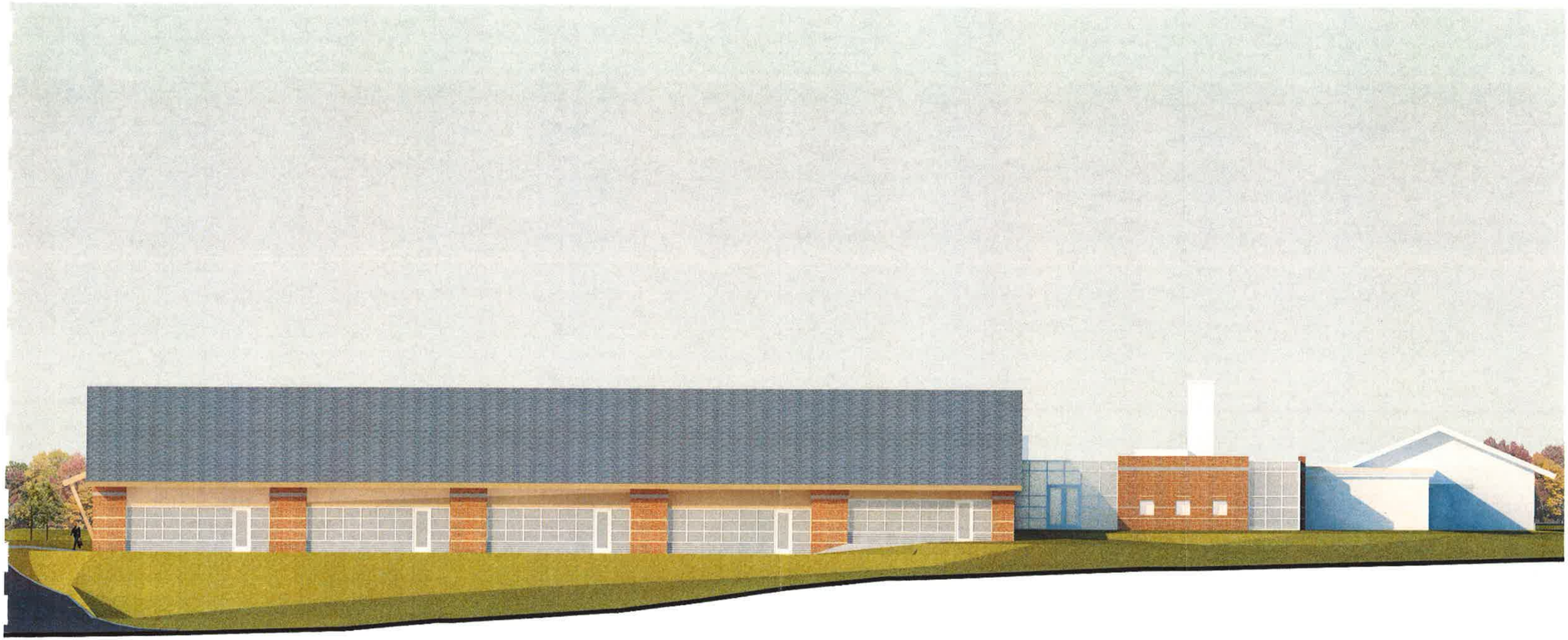
Scale: NONE

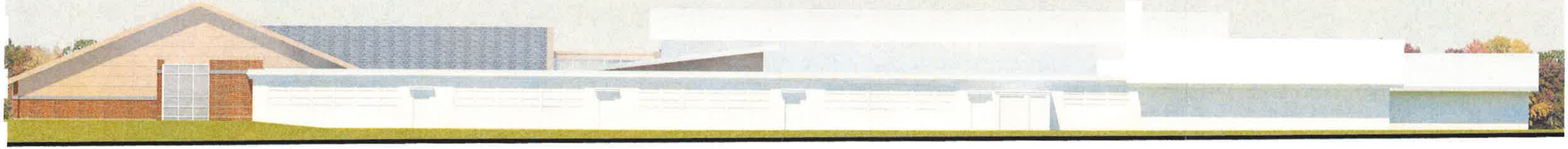
Drawn By: D. A. PETRUCELLI

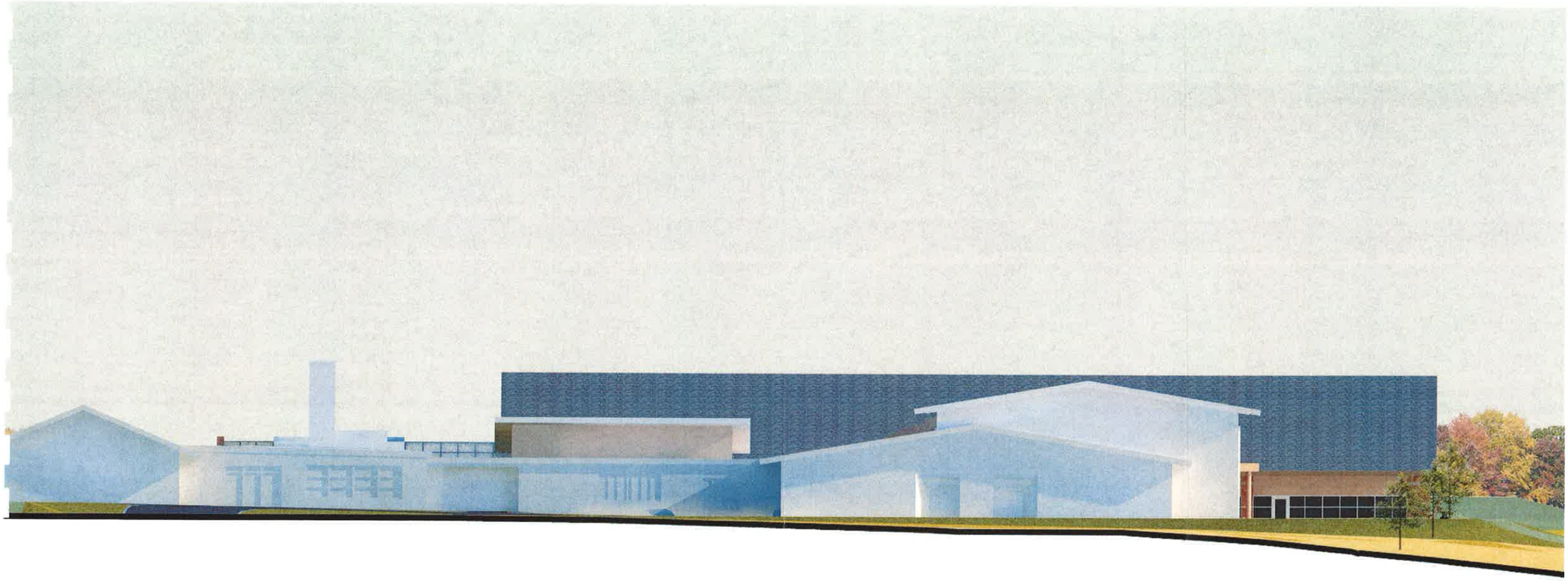
Project Number: 12140

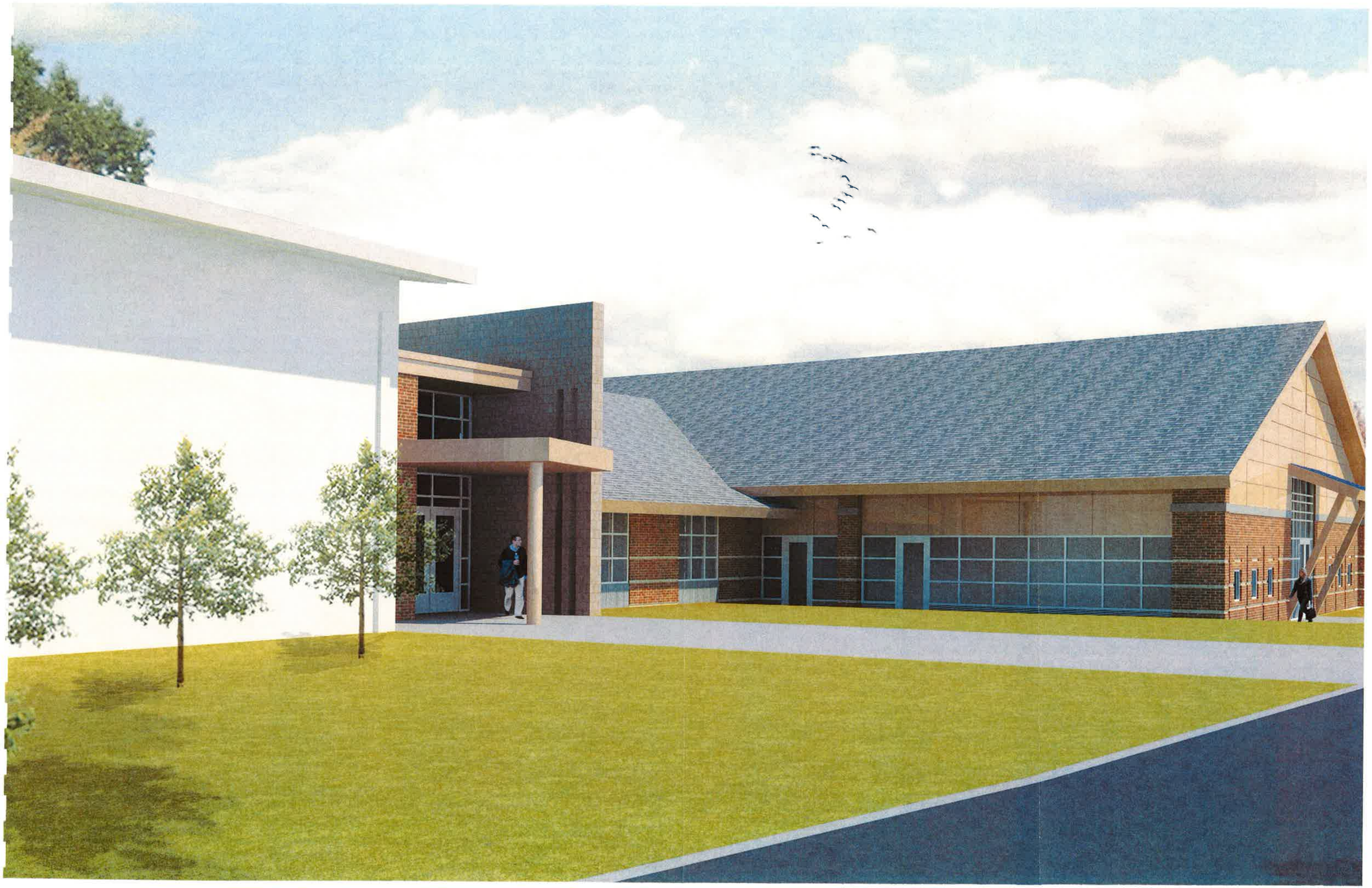
Drawing Number:

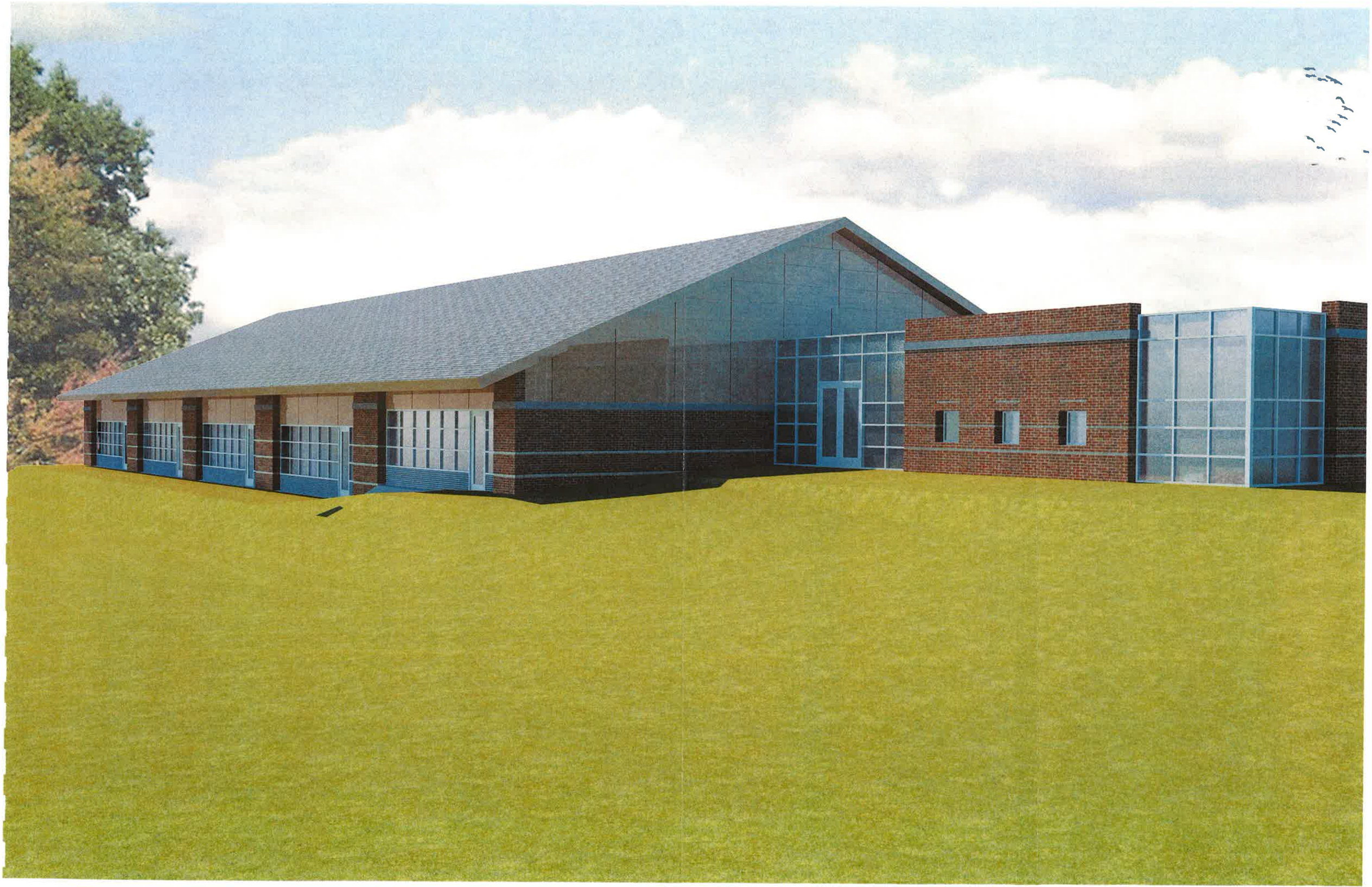


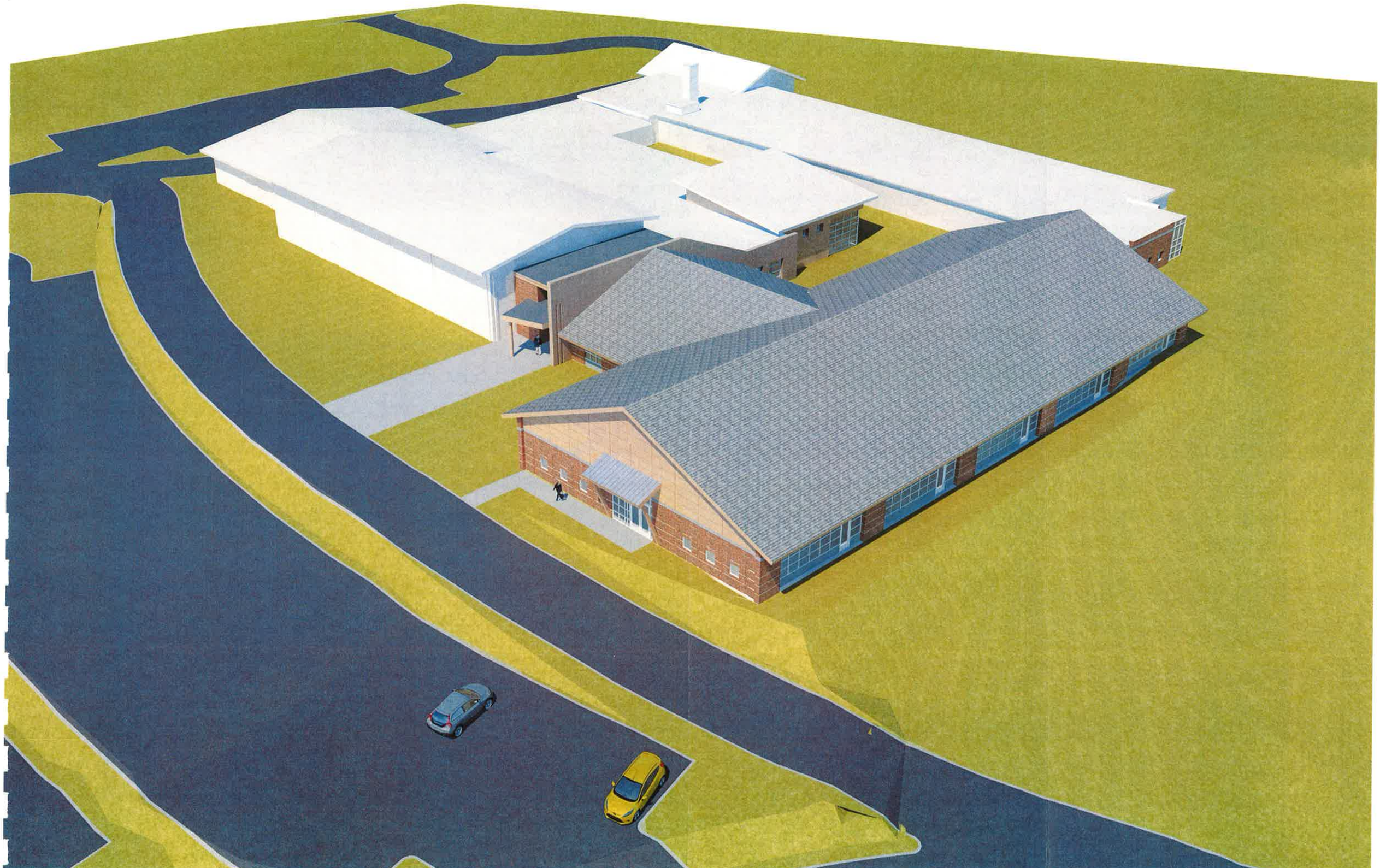


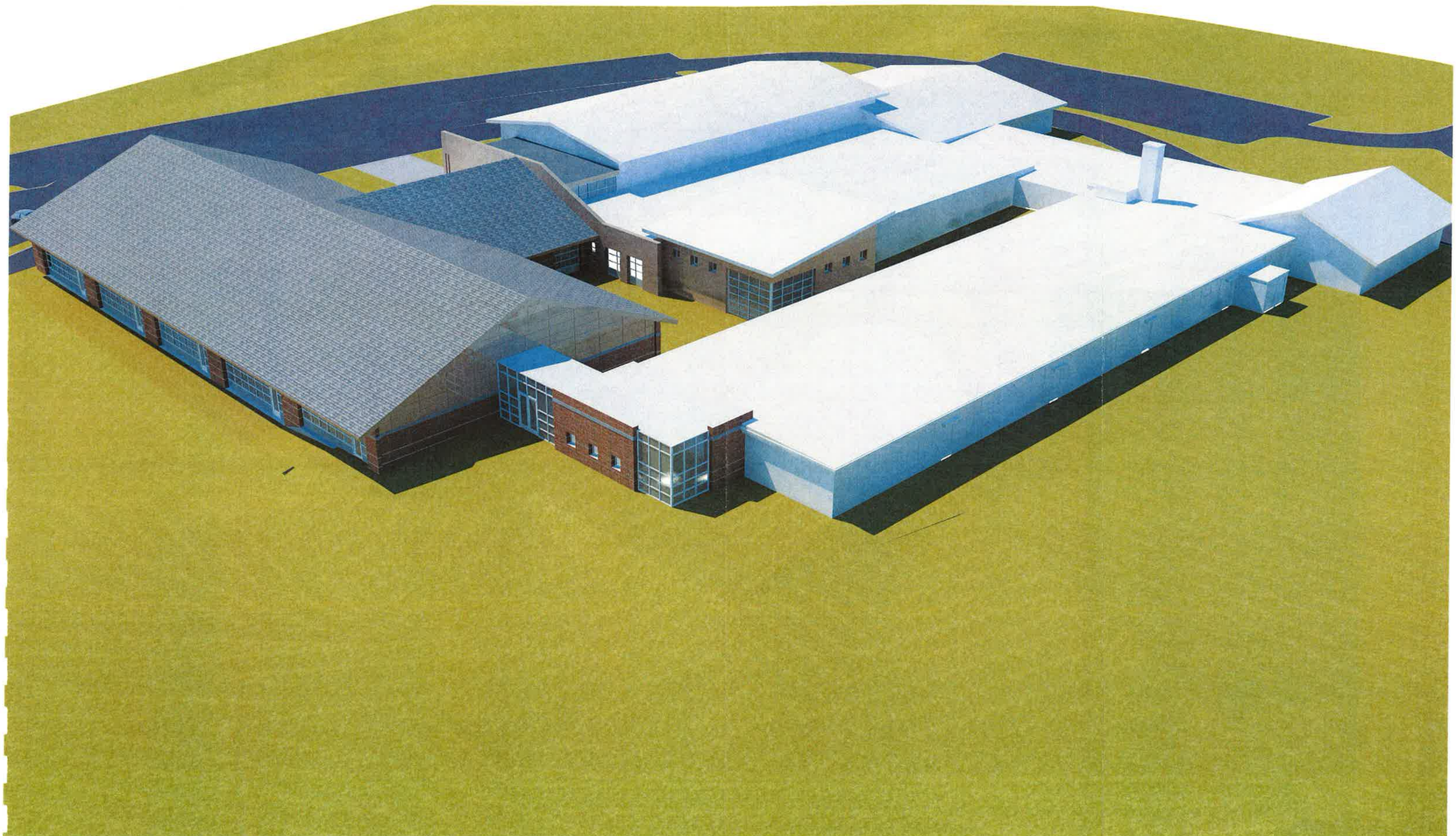












CRYSTAL LAKE ELEMENTARY SCHOOL
ELLINGTON, CT
STATE PROJECT NO. 124-0054

S/P+A PROJECT NO. 08.047

DIVISION 11 – EQUIPMENT

DIVISION 12 – FURNISHINGS

DIVISION 14 – CONVEYING EQUIPMENT

DIVISION 21 – FIRE SUPPRESSION

DIVISION 22 – PLUMBING

DIVISION 26 – ELECTRICAL

DIVISION 27 – COMMUNICATIONS

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

DIVISION 31 – EARTHWORK

DIVISION 32 – EXTERIOR IMPROVEMENTS

DIVISION 33 – UTILITIES

END OF TABLE OF CONTENTS

Ellington Board of Education

Crystal Lake Elementary School

Expansion & Renovate as New

1/15/2013

Proposed Opinion of Probable Construction Cost - Schematic Submission

Task	s.f.	Total Cost per s.f.	Total Project Development Cost
01 0000 General Requirements			
General Conditions/Requirements	51,268	$14.00	$717,752
Subtotal	**51,268**	**$14.00**	**$717,752**
02 0000 Abatement			
Existing Conditions abatement (asb & lead)	32,542	LS	$212,555
Existing Conditions abatement (PCB)	18,726	LS	$35,000
Subtotal	**51,268**		**$247,555**
02 000 Demolition			
Existing Conditions - Selective Demolition	32,542	$6.50	$211,523
Subtotal	**32,542**		**$211,523**
03 0000 Concrete			
Existing Conditions - Concrete	32,542	$4.00	$130,168
New Construction - Concrete on grade	18,726	$18.00	$337,068
Subtotal	**51,268**		**$467,236**
04 000 Masonry			
Existing Conditions - Masonry	32,542	$6.50	$211,523
New Construction - Masonry	18,726	$28.00	$524,328
Subtotal	**51,268**		**$735,851**
05 000 Structural Steel			
Existing Conditions - Steel	32,542	$4.00	$130,168
New Construction - Steel	18,726	$20.00	$374,520
Subtotal	**51,268**		**$504,688**
06 000 Rough Carpentry			
Existing Conditions - Carpentry	32,542	$1.50	$48,813
New Constructions - Carpentry	18,726	$3.00	$56,178
Subtotal	**51,268**		**$104,991**
06 000 Finish Carpentry			
Existing Conditions - Finish Carpentry	32,542	$11.50	$374,233
New Constructions - Finish Carpentry	18,726	$11.50	$215,349
Subtotal	**51,268**		**$589,582**
07 000 Thermal & Moisture Protection			
Existing Conditions - Thermal & Moisture	32,542	$18.00	$585,756
New Conditions - Thermal & Moisture	18,726	$24.00	$449,424
Subtotal	**51,268**		**$1,035,180**
08 000 Doors & Windows			
Existing Conditions - Doors & Windows	32,542	$18.00	$585,756
New Construction - Doors & Windows	18,726	$20.00	$374,520
Subtotal	**51,268**		**$960,276**
09 000 Finishes			
Existing Conditions - Finishes	32,542	$18.00	$585,756
New Construction - Finishes	18,726	$20.00	$374,520
Subtotal	**51,268**		**$960,276**

10 000 Specialties			
Existing Conditions - Specialties	32,542	$3.00	$97,626
New Construction - Specialties	18,726	$3.00	$56,178
Subtotal	**51,268**		**$153,804**
11 000 Equipment			
Existing Conditions - Equipment	32,542	$5.00	$162,710
New Construction - Equipment	18,726	$5.00	$93,630
Subtotal	**51,268**		**$256,340**
12 000 Furnishings			
Existing Conditions - Furnishings	32,542	$2.35	$76,474
New Construction - Furnishings	18,726	$1.35	$25,280
Subtotal	**51,268**		**$101,754**
13 000 Specialty Systems			
Existing Conditions - Specialty Systems	32,542	$0.00	$0
New Construction - Specialty Systems	18,726	$0.00	$0
Subtotal	**51,268**		**$0**
14 000 Conveyance System			
Existing Conditions - Conveyance System	32,542	$0.00	$0
New Construction - Conveyance System	18,726	$0.00	$0
Subtotal	**51,268**		**$0**
21 000 Fire Protection			
Existing Conditions - Fire protection	32,542	$9.80	$318,912
New Construction - Fire protection	18,726	$9.80	$183,515
Subtotal	**51,268**		**$502,426**
22 000 Plumbing			
Existing Conditions - Plumbing	32,542	$8.50	$276,607
New Construction - Plumbing	18,726	$12.00	$224,712
Subtotal	**51,268**		**$501,319**
23 000 HVAC			
Existing & new Heating & Ventilation	43,768	$30.00	$1,313,040
Existing & New Air Conditioning	7,500	$50.00	$375,000
Fuel Oil Stoarge Tank	0	LS	$150,000
MEP temporary connections & interface	51,268	$1.00	$51,268
Subtotal	**51,268**		**$1,889,308**
26 000 Electrical			
Existing Conditions - Electrical	32,542	$25.00	$813,550
New Construction - Electrical	18,726	$24.00	$449,424
Elec. temporary connections & interface	51,268	$1.50	$76,902
Subtotal	**51,268**		**$1,339,876**
31 000 Earthwork/Exterior Improvements			
Existing / New Construction -Site & Earthwork	51,268	$45.17	$2,315,575
Subtotal	**51,268**		**$2,315,575**
Additional Expenses			
Construction Estimate at time of schematics		1%	**$135,953**
Inflation factor for 2013-2015		2%	**$271,906**
CONSTRUCTION TOTAL			
Construction Total			**$14,003,172**

Soft Costs - Design & Professional Fees			
A&E fees from SD through CA (original fee)			$640,185
A&E fees (additional services allowance)			$25,000
Owners Construction Administrator			$175,000
Owners Representative			$175,000
Printing Costs			inc.
As-Builts drafting/production			inc
Security consultant			inc.
kitchen & food service consultant			inc.
High performance Bldg. standards design/sdmin.			inc.
Site Survey			inc.
geotechnical consultant (borings & report)			$13,500
Traffic study			$20,000
Haz. Materials, radon, PCB testing			$22,000
Haz. Materials, radon, PCB abatement design			inc.
Special Inspections			$45,000
Commissioning agent			$50,600
Soft Costs - Other Professional Fees			
Program Manager fees			$0
Threshold Review			$0
CM Preconstruction fee			$0
Commissioning coordination			$2,500
Construction Material Testing			$35,000
Builders Risk			$37,809
Soft Costs - Other Fees			
Misc. Administration costs			$20,000
Insurance (town) and legal ads			$15,000
Printing costs during CA			$2,500
Furniture Moving (phasing relocation)			$10,000
Local Plan review costs			$8,500
Soft Costs - Fixtures, Furnishings & Equipment			
Furnishings			$700,000
Technology			$87,500
Gymnasium equipment			$20,000
Soft Costs - Contingencies & Allowances			
Owner contingency (7.5%)			$1,050,238
Design Contingency (2.5%)			$350,079
Bonding Costs			$350,000
State Building permit (assumes no local cost)			$3,921
Sewer Costs			$60,000
Management & Custodial Staff costs			$25,000
Environmental conditions / winter conditions			$50,000
IAQ allowance			$15,000
Final Cleaning Allowance			$25,000
C.A. As-Built Drawing Reproduction allowance			$2,500
Total			**$18,040,003**

	Ineligible	Limited Eligible	Eligible
Amount	$210,000	340,000	$17,490,003
Reimbursement Rate	0.00%	29.11%	58.21%
Space Penalty	92.26%	92.26%	92.26%
State of Ct Share	$0.00	$91,313	$9,392,927
Town of Ellington Share	$210,000	$248,687	$8,097,076
Total State Share			$9,484,240
Total Town of Ellington Share			$8,555,763
Total Project Cost			**$18,040,003**

Alternate #1 (add geothermal to base bid AC)	$110,000
Alternate #1 (AC gym, music, café, kitchen)	$310,750
add geothermal to Alt #1	$220,000
Alternate #2 (AC entire building)	$1,244,100
add geothermal to Alt #2	$660,000

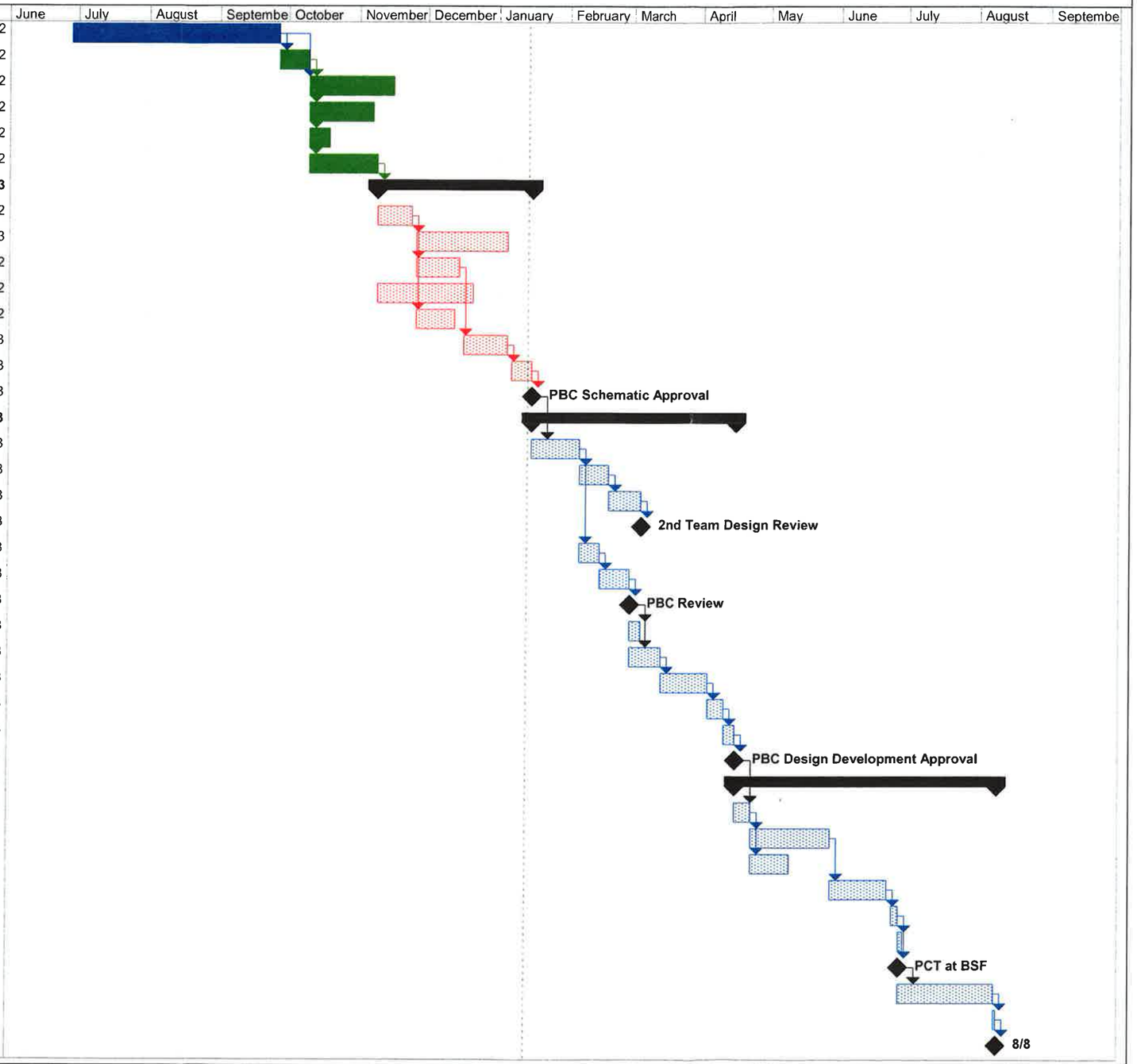
Existing Renovate as new Cost / s.f. (including site, excluding soft costs) $235.00 / s.f.

Proposed Addition Cost / s.f. (including site, excluding soft costs) $340.00 / s.f.

Crystal Lake School

Renovate as New Project Schedule
Town of Ellington

ID	Task Name	Duration	Start	Finish
1	Interview, Contract Prep and Signing	65 days	Thu 6/28/12	Wed 9/26/12
2	Kickoff Meeting/Program Checking or Revisions	9 days	Thu 9/27/12	Tue 10/9/12
3	Construction Manager Selection Process	27 days	Wed 10/10/12	Thu 11/15/12
4	Commissioning Agent Selection Process	20 days	Wed 10/10/12	Tue 11/6/12
5	Field Surveys	7 days	Wed 10/10/12	Thu 10/18/12
6	Engagement Interviews, Program Devel	22 days	Wed 10/10/12	Thu 11/8/12
7	**Schematic Design Phase**	**48 days**	**Fri 11/9/12**	**Tue 1/15/13**
8	1st Design Concepts	11 days	Fri 11/9/12	Fri 11/23/12
9	Reviews at school and Bldg Committee (PBC) to develop floor plans	30 days	Mon 11/26/12	Fri 1/4/13
10	Revise design/engineering designs and approach	15 days	Mon 11/26/12	Fri 12/14/12
11	HazMat/PCBs Testing	30 days	Fri 11/9/12	Thu 12/20/12
12	Geotechnical Borings and Engineering	13 days	Mon 11/26/12	Wed 12/12/12
13	CM Estimating	15 days	Mon 12/17/12	Fri 1/4/13
14	Reconcile Detailed Estimates with CM, review with PBC	7 days	Mon 1/7/13	Tue 1/15/13
15	PBC Schematic Approval	0 days	Tue 1/15/13	Tue 1/15/13
16	**Design Development**	**64 days**	**Wed 1/16/13**	**Mon 4/15/13**
17	Develop Plans and Details	15 days	Wed 1/16/13	Tue 2/5/13
18	1st Team Design Review	9 days	Wed 2/6/13	Mon 2/18/13
19	Develop Elevations, Details, Schedules	10 days	Tue 2/19/13	Mon 3/4/13
20	2nd Team Design Review	0 days	Mon 3/4/13	Mon 3/4/13
21	Re-Field Survey	7 days	Wed 2/6/13	Thu 2/14/13
22	Develop Building Details	9 days	Fri 2/15/13	Wed 2/27/13
23	PBC Review	0 days	Wed 2/27/13	Wed 2/27/13
24	Plan Review with Local Officials	3 days	Thu 2/28/13	Mon 3/4/13
25	Design Development Specifications	10 days	Thu 2/28/13	Wed 3/13/13
26	CM Estimating	15 days	Thu 3/14/13	Wed 4/3/13
27	Reconcile Detailed Estimates with CM, review with PBC	5 days	Thu 4/4/13	Wed 4/10/13
28	Reconciliation with Program Team	3 days	Thu 4/11/13	Mon 4/15/13
29	PBC Design Development Approval	0 days	Mon 4/15/13	Mon 4/15/13
30	**Construction Document Phase**	**83 days**	**Tue 4/16/13**	**Thu 8/8/13**
31	Detailed Field Surveys and Engineering Verifications	5 days	Tue 4/16/13	Mon 4/22/13
32	100% CDs	25 days	Tue 4/23/13	Mon 5/27/13
33	CD Specifications	13 days	Tue 4/23/13	Thu 5/9/13
34	CM Estimating	19 days	Tue 5/28/13	Fri 6/21/13
35	Bldg Committee + BOE Approval	3 days	Mon 6/24/13	Wed 6/26/13
36	Coord Bid Docs with CM and Finance Dept	2 days	Thu 6/27/13	Fri 6/28/13
37	PCT at BSF	0 days	Wed 6/26/13	Wed 6/26/13
38	BSF Plan Review (duration??)	30 days	Thu 6/27/13	Wed 8/7/13
39	State DOE BSF Approval to Bid	1 day	Thu 8/8/13	Thu 8/8/13
40		0 days	Thu 8/8/13	Thu 8/8/13



Contract Stage Project Schedule
Date: Mon 1/14/13

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

Petrucelli & Associates, Inc.
Architects / Engineers / Interior Designers

Crystal Lake School

Renovate as New Project Schedule
Town of Ellington

ID	Task Name	Duration	Start	Finish
1	Interview, Contract Prep and Signing	65 days	Thu 6/28/12	Wed 9/26/12
2	Kickoff Meeting/Program Checking or Revisions	9 days	Thu 9/27/12	Tue 10/9/12
3	Construction Manager Selection Process	27 days	Wed 10/10/12	Thu 11/15/12
4	Commissioning Agent Selection Process	20 days	Wed 10/10/12	Tue 11/6/12
5	Field Surveys	7 days	Wed 10/10/12	Thu 10/18/12
6	Engagement Interviews, Program Devel	22 days	Wed 10/10/12	Thu 11/8/12
7	**Schematic Design Phase**	**48 days**	**Fri 11/9/12**	**Tue 1/15/13**
8	1st Design Concepts	11 days	Fri 11/9/12	Fri 11/23/12
9	Reviews at school and Bldg Committee (PBC) to develop floor plans	30 days	Mon 11/26/12	Fri 1/4/13
10	Revise design/engineering designs and approach	15 days	Mon 11/26/12	Fri 12/14/12
11	HazMat/PCBs Testing	30 days	Fri 11/9/12	Thu 12/20/12
12	Geotechnical Borings and Engineering	13 days	Mon 11/26/12	Wed 12/12/12
13	CM Estimating	15 days	Mon 12/17/12	Fri 1/4/13
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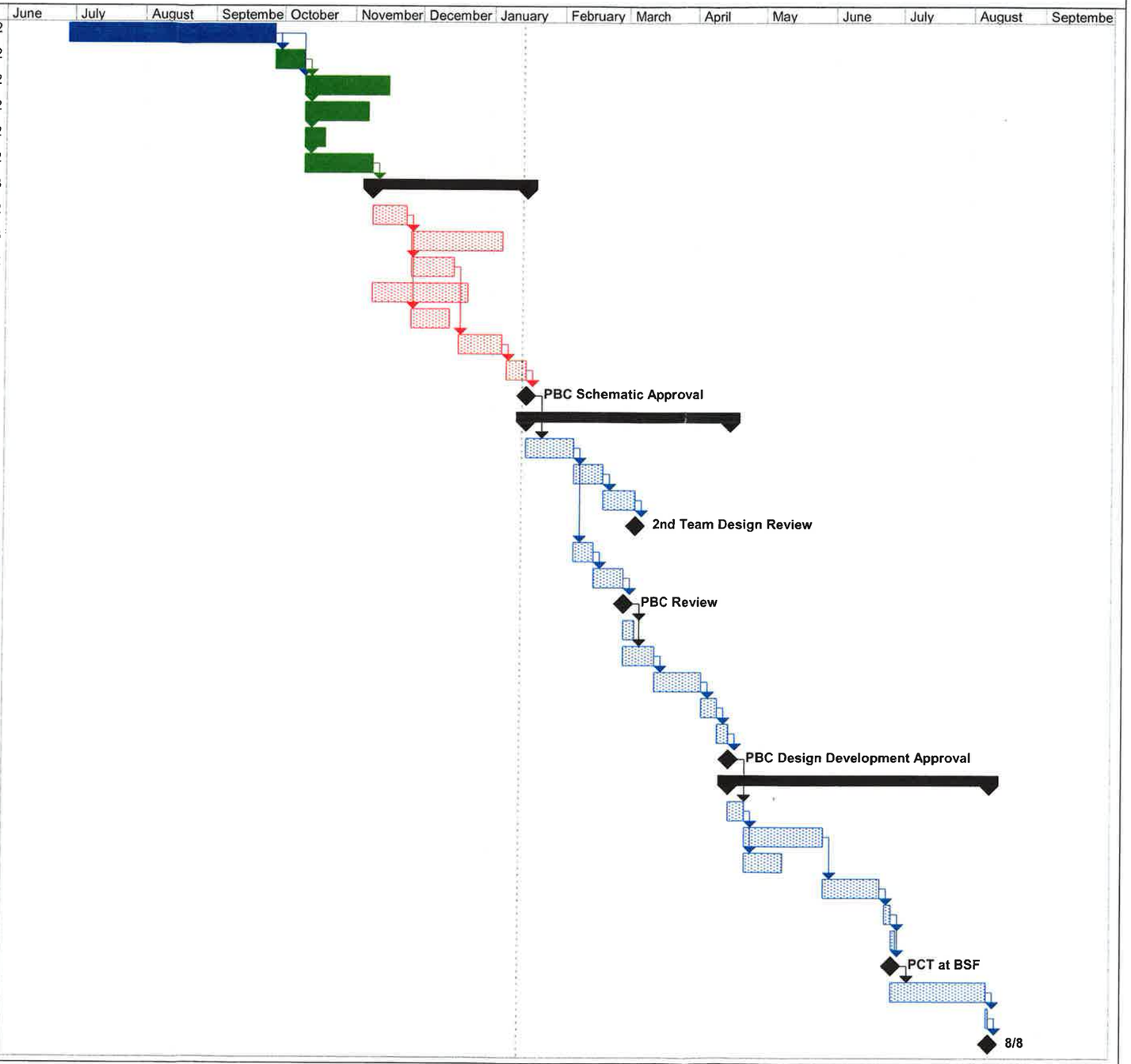

Contract Stage Project Schedule
Date: Mon 1/14/13

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

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