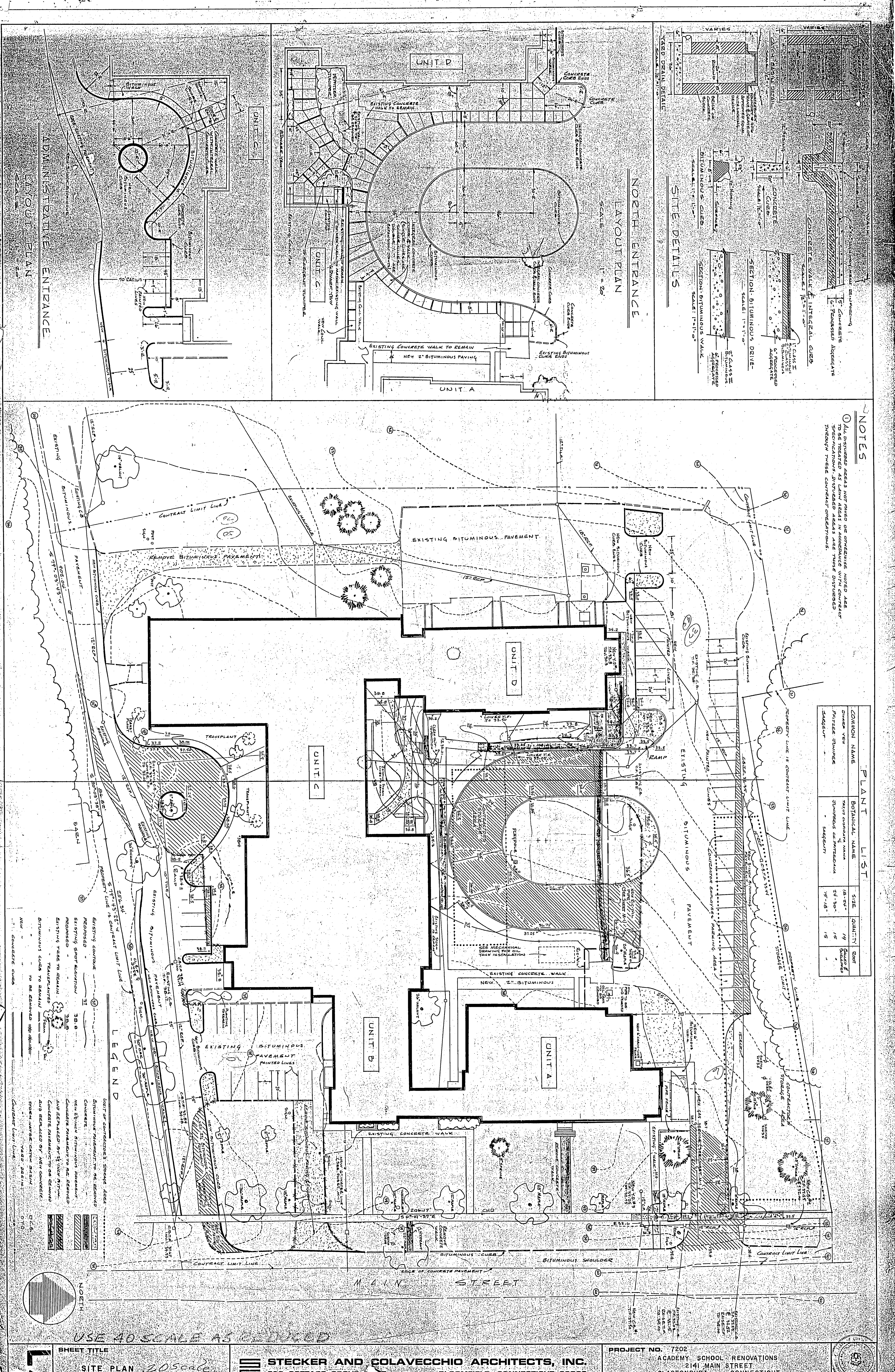


NOTES

1. ALL DISTURBED AREAS NOT PAVED OR OTHERWISE NOTED ARE TO BE TREATED AS LAWN AREAS IN ACCORDANCE WITH CONTRACT SPECIFICATIONS. DISTURBED AREAS ARE THOSE DISTURBED THROUGH THESE CONTRACT OPERATIONS.

PLANT LIST

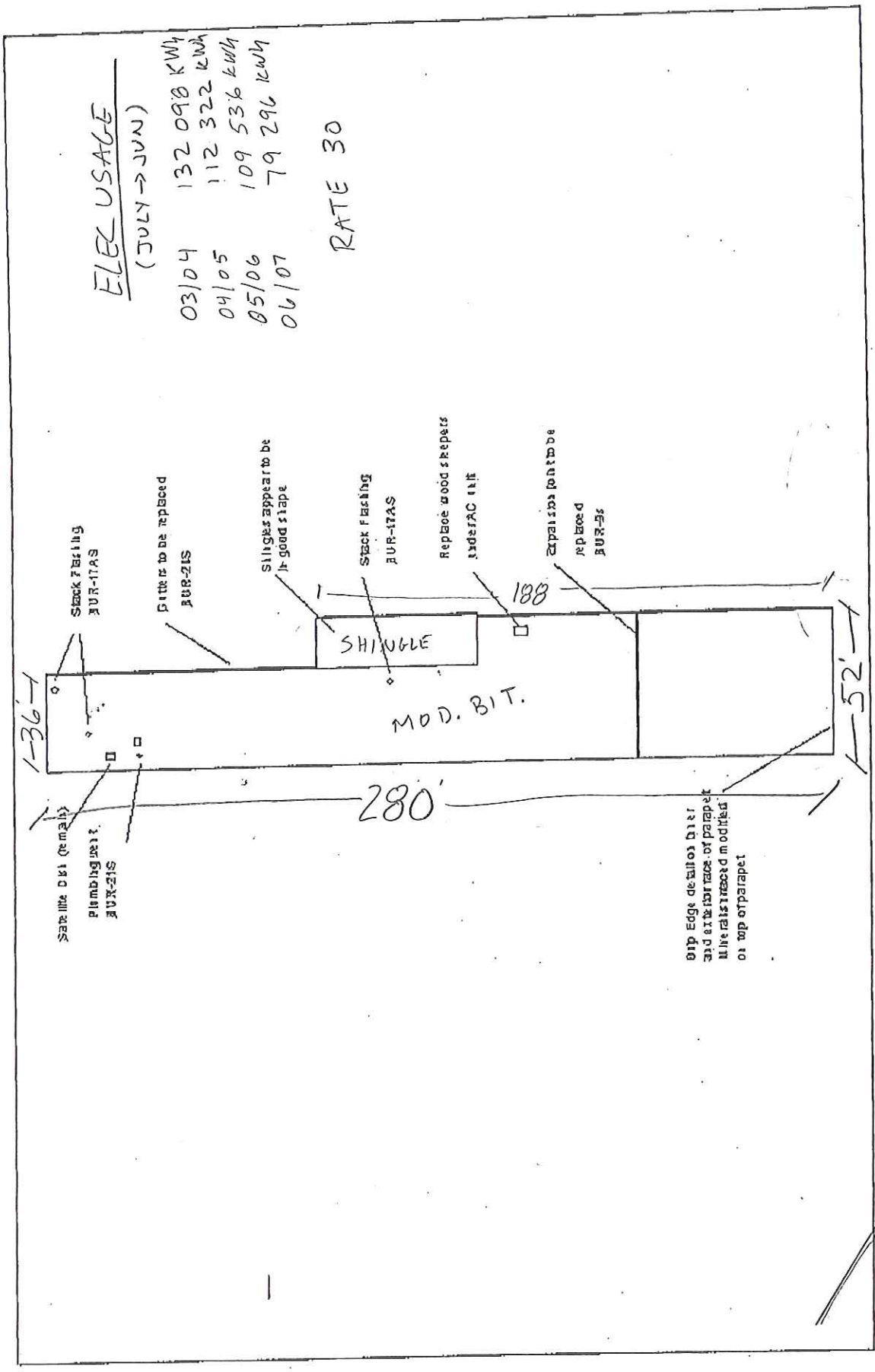
COMMON NAME	BOTANICAL NAME	SIZE	QUANTITY	ROOT
DWARF YEW	TAXUS CUSPIDATA NANA	18-24"	14	BALLED & BURLAPPED
PFITZER JUNIPER	JUNIPERUS CH. PFITZERIANA	24-30"	15	"
SARGENT "	" SARGENTI	15-18"	15	"

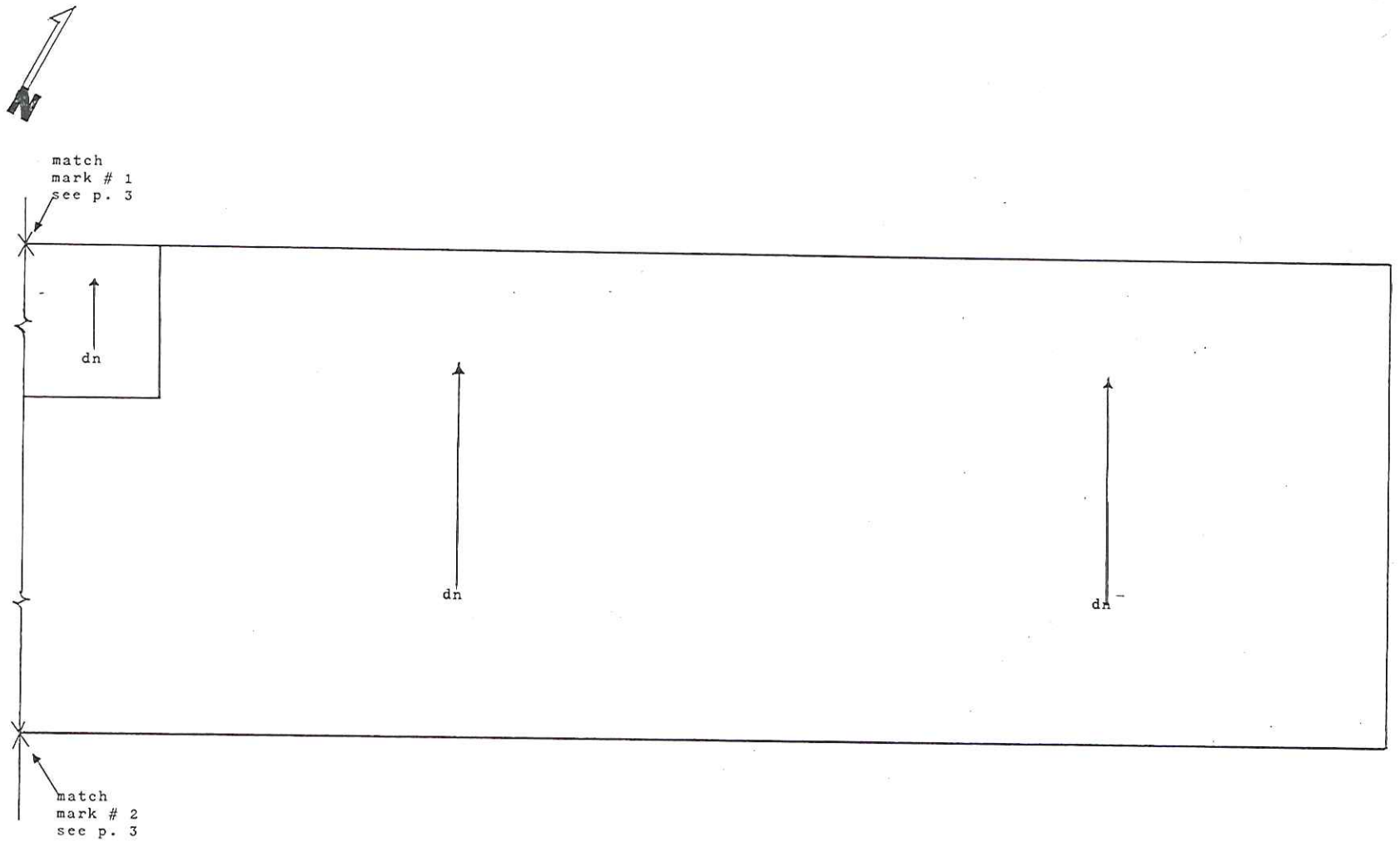
USE 40 SCALE AS ENLARGED

SHEET TITLE SITE PLAN 20 scale SCALE 1/8" = 1'-0" DRAWN BY	STECKER AND COLAVECCHIO ARCHITECTS, INC. 800 COTTAGE GROVE BLOOMFIELD, CONNECTICUT 06002	PROJECT NO. 7202 ACADEMY SCHOOL RENOVATIONS 2141 MAIN STREET GLASTONBURY, CONNECTICUT DATE NOV 5 73	

VMG P.V.

ATTACHMENT "A"



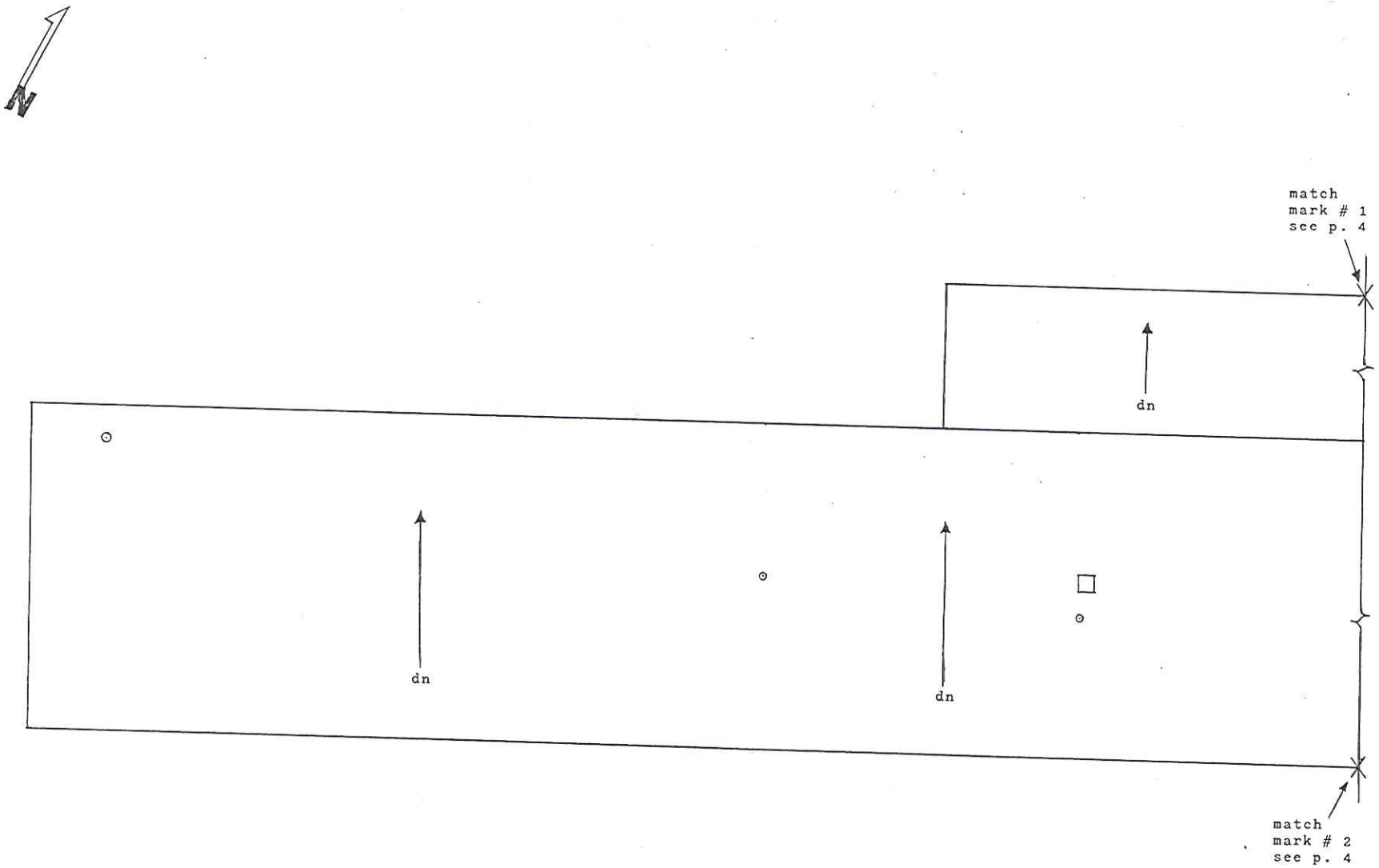


ROOF

Town of Glastonbury

Vehicle Maintenance Garage and Offices

2380 New London tpke.	P- T16/01	Scale - None	Date 8/18/89
Drawn by- M. Malloy	Date Revised-		



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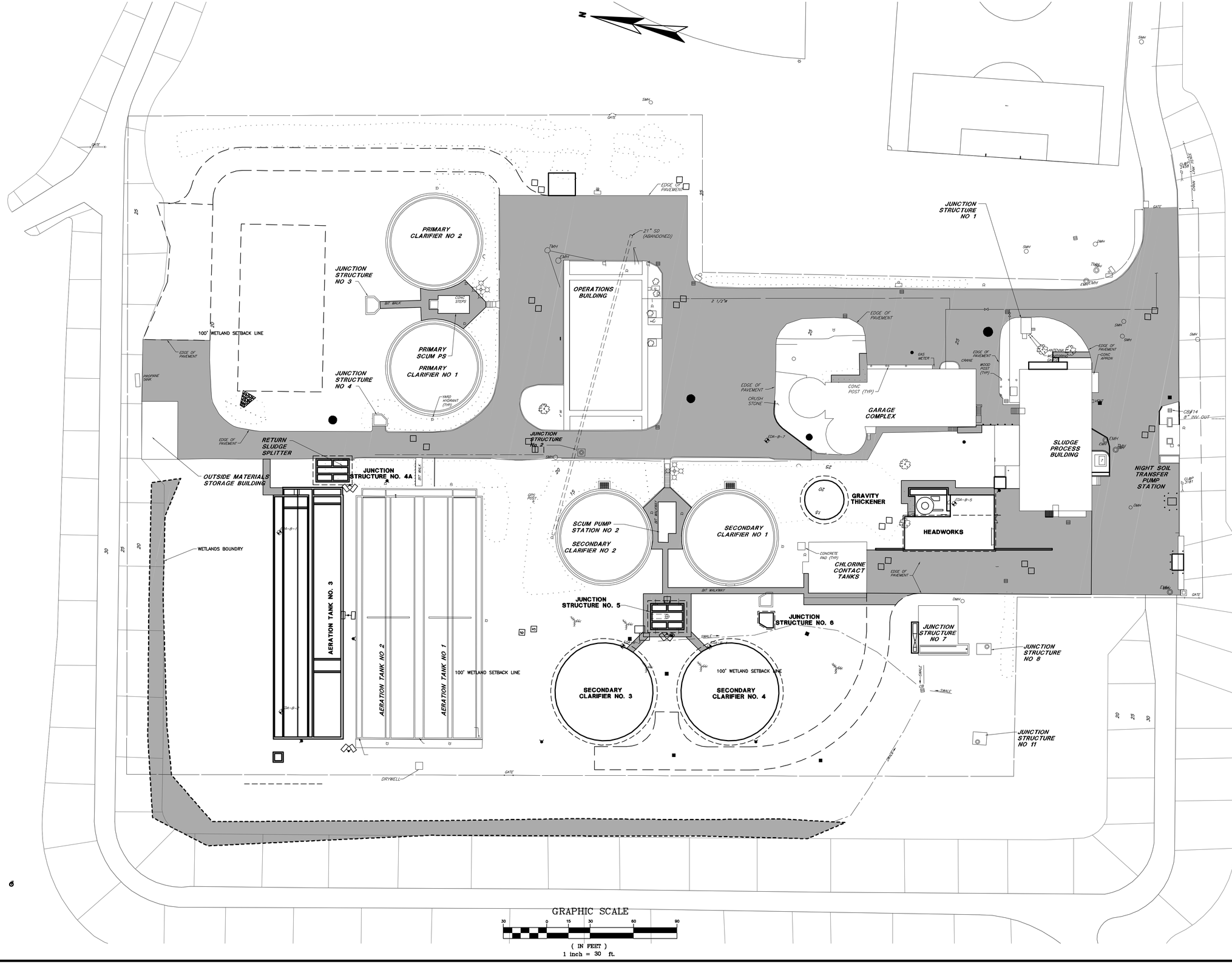

PROGRESS PRINTS
ISSUED FOR REVIEW: 4-06/A
ISSUED FOR BIDDING: 10-06/A

NO	REVISIONS	APP'D	DATE
1	RECORD DRAWING	CNP	10-10
2			
3			
4			
5			

VAULT LOCATION:
LAST WORKED ON:
FILENAME:

DRAWN BY:
CHECKED BY:
DATE: 8-7-06
APPROVED BY:
DATE: 9-29-06
BOOK NO.
PROJECT NO. 10440E
SCALE

Wright-Pierce
Offices throughout New England
www.wright-pierce.com

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF THE INFORMATION COMPILED AND FURNISHED BY OTHERS. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

TOWN OF GLASTONBURY, CONNECTICUT
WATER POLLUTION CONTROL FACILITIES UPGRADE

EXISTING SITE CONDITIONS AND DEMOLITION PLAN

DWG C-3
OF 247

Connecticut Clean Energy Fund
Clean Energy Communities Program
Glastonbury Site Inspection Report

May 31, 2006

Prepared for

Connecticut Clean Energy Fund

200 Corporate Place, 3rd Floor
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1.0 Glastonbury Site Section Overview

An overview of photovoltaic technology, markets and applications was made at the Glastonbury Town Hall to various town facility personnel, a science teacher from one of the middle schools as well as representatives from a couple of local citizen groups. With over 100 residents signing up for the program in a "non-congested" area of the State, the town qualifies for 1 kW of photovoltaic system(s). The representative from Connecticut Clean Energy Fund, Bryan Garcia collected the list of attendees. After the presentations, Mr. Herb Schwind and Director of School Facilities accompanied CCEF consultant to the first two sites. Mark Brayman, Lead Maintainer then accompanied CCEF consultant to the last two sites. The prospective sites were Glastonbury Town Hall, Glastonbury Riverfront Community Center, Glastonbury High School and a new elementary school under construction in the southern portion of the town. The presentation and site visits were performed on May 31st. The day was clear and the temperature was in the high 70s.

2.0 Glastonbury Town Hall

The Town Hall offers an good location for an 1 to 2 kW array or larger – up to 10 kW, with an open field to the south of a clear roof space. GoogleEarth images of the western side of Glastonbury are obscured, so a very rough layout of the town hall building is depicted in figure 1 overlayed on map. Roof access is up a steel ladder through a hatch, presenting the obvious challenges to installation and tours. The roof is a "built up" roof, scheduled for replacement next year. The roof has a parapit wall of about 2 ft high. The optimal section for an installation has a modest pitch sloping to the west, as shown in figure 4. This must be taken into account when determining to optimal form of array installation. It is roughly estimated the space could accommodate as much as a 10 to 15 kW array.

Fig 1: Location of Glastonbury Town Hall

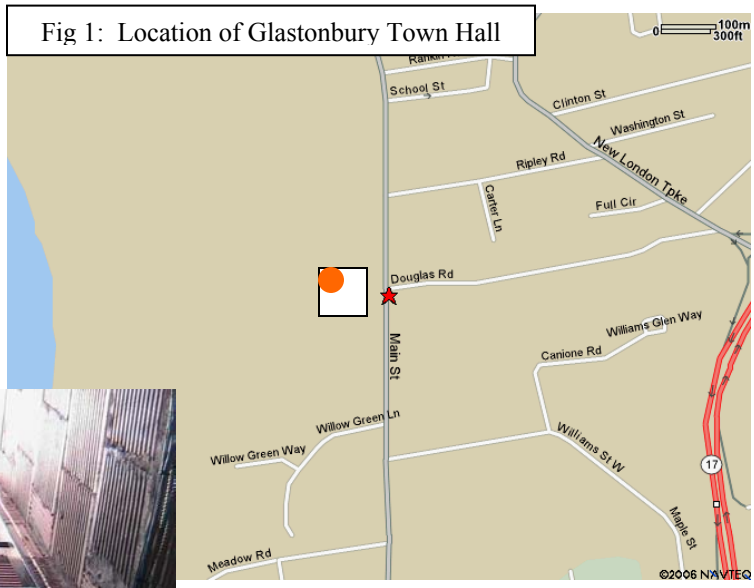

Fig 2: Roof Hatch at Glastonbury Town Hall

Solar access is good at this site. Fig. 3 below shows panoramic view more of the west towards the Connecticut River, but the image of the pathfinder with the correct orientation shows no major obstructions.

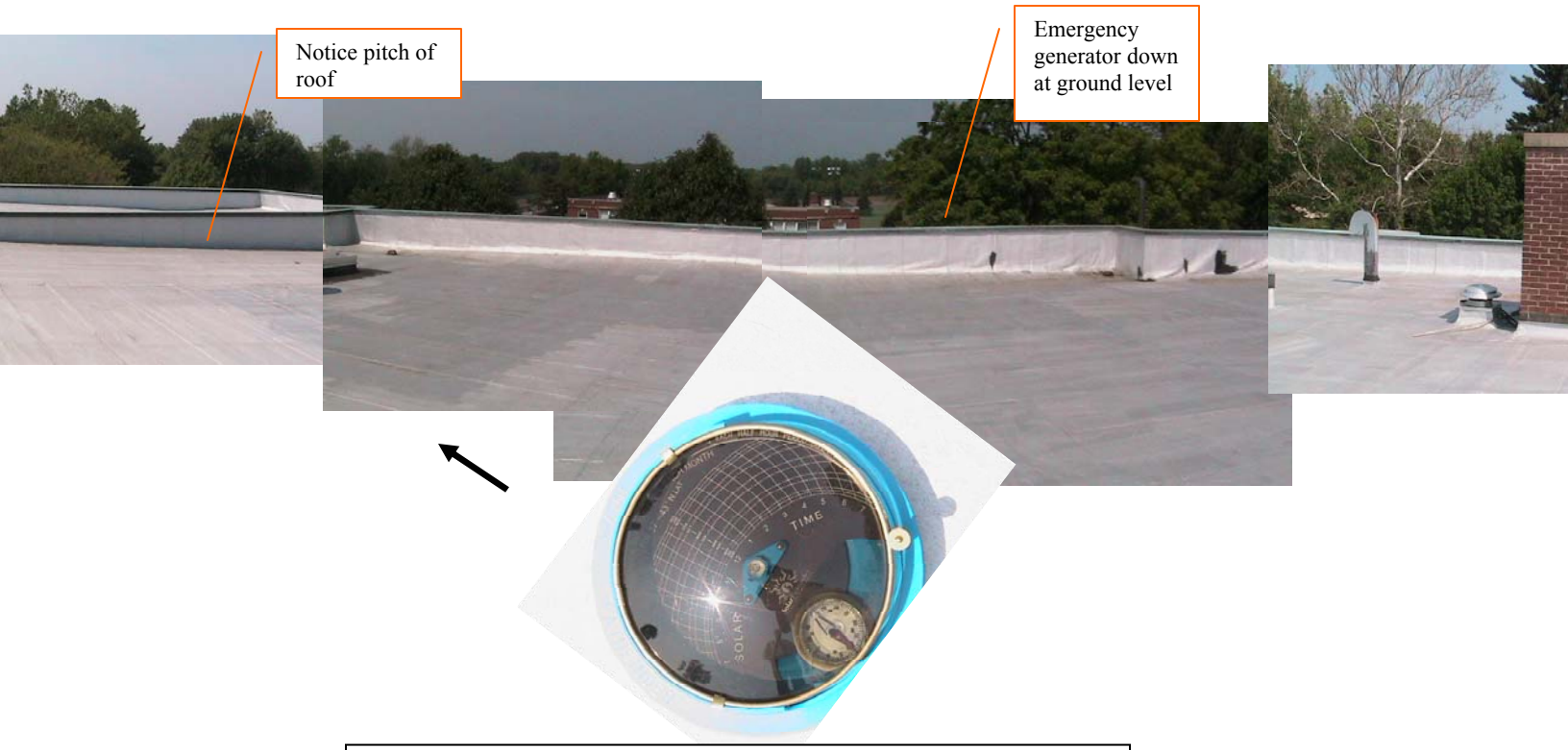

Fig 3: Panoramic western view from optimal roof location

The building is outfitted with an emergency generator on the western side of the building (Figure 5). Conduit runs from the generator into the basement, where the main is located (Figure 6). It is feasible to run conduit down the outside of the building directly to the main. The building appears to be served by a 600 amp, 240 VAC service. Mr. Schwind is pursuing confirmation of this information. It may be feasible to install a PV system with battery storage that can work in concert with the back up generator and the existing

Fig 4: View of Generator from roof

Fig 5: View of generator conduit into building and of west side wall.

automatic transfer switch, however, it was felt that this would be outside of the scope of this evaluation. There were 120 VAC CB boxes with spare breakers that could potentially be used as a connection point for a small PV system.

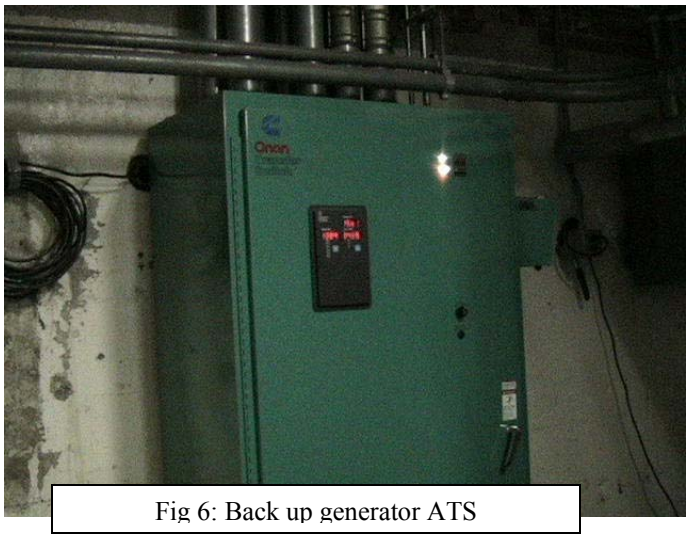

Fig 6: Back up generator ATS

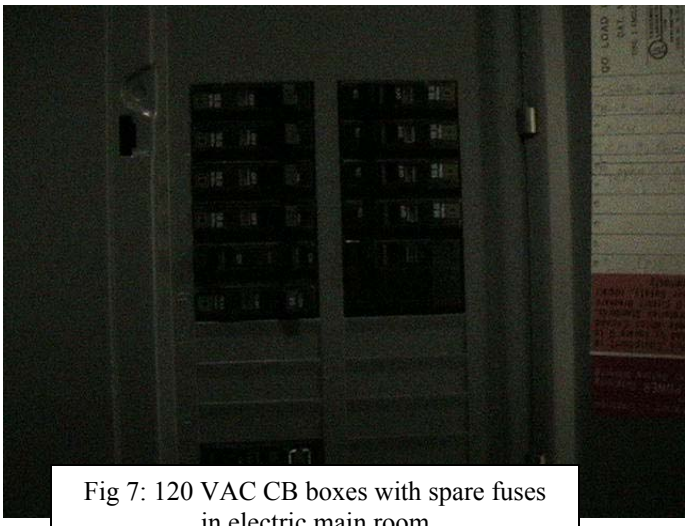

Fig 7: 120 VAC CB boxes with spare fuses in electric main room

High speed internet access was available throughout the building. Therefore, setting up the Fat Spaniel system should not encounter any problems. An optimal area to locate a crane for delivery of bulk materials to the roof was not readily apparent, but the building did have parking places and driveways in close proximity in multiple locations of the building.

Overall, the Town Hall does not seem like the best location for a PV system due to the age of the roof and the access, but it was certainly suitable. When the town does replace the roof, it should either consider installing penetrations for PV module mounting brackets for a fixed mount, tilted array (figure 8 – UniRac system), as shown in figure or consider using a flat roof system such as the powerguard (figure 9 – PowerLight) paver or thin-film (figure 10 – Uni-Solar, Solar Integrated Technologies or Pfister Energy) integrated roofing system

Figure 8: U-LA Tilt Array

Figure 9: PowerGuard

Figure 10: Roll-on PV roofing system

3.0 Glastonbury Riverfront Community Center

Glastonbury Riverfront Community Center, located in the same basic area as the town hall, is a new building with a clear portion of its slanted shingle roof tilted toward the

south. It provides sufficient space for an estimated 1-2 kW of solar panels, therefore

Fig 11: Approximate location of Riverfront community center

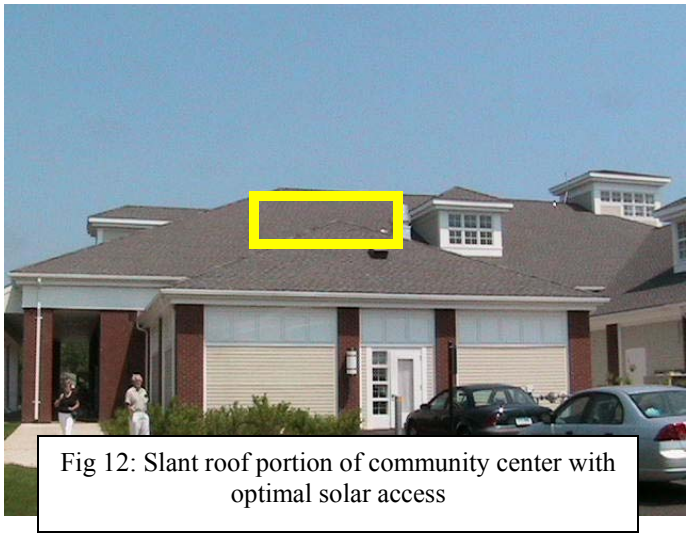

Fig 12: Slant roof portion of community center with optimal solar access

offering little room for expansion. The multiple facets and gables on the building, as shown in figure12 do not lend them selves to anything larger. The recommended roof location has virtually unobstructed solar access. The ground level view from beneath the roof is shown below. The pathfinder confirms this observation. The open space would enable easy view of the solar panels from the ground. Additionally, the plans for the grounds surrounding the community center include such ideas as installing an amphitheater on the banks of the Connecticut River.

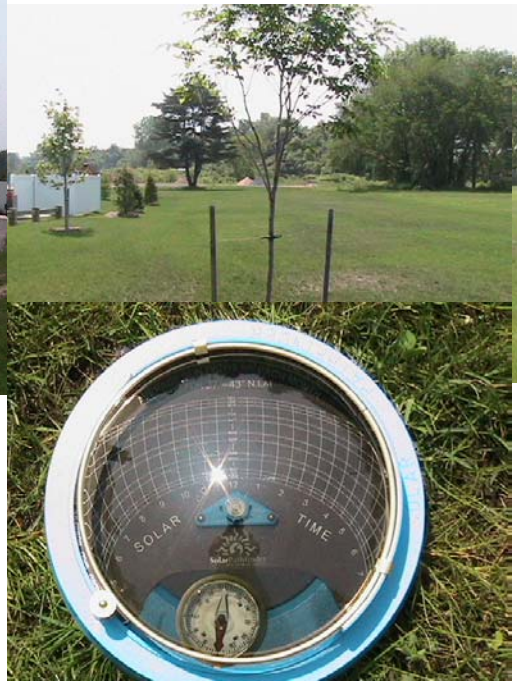

Fig 13: Southerly view from ground below optimal roof location and pathfinder image

The roof mount system lends itself to either a roof-jack system (figure 14) or integrated shingle system (fig. 15). The former usually comes at a lower cost, but more conspicuous than the latter.

Fig 14: Example of Roof Jack system for standard modules mounted on slant roof

Fig 15: Example of integrated shingle system using Sunslates

Interconnection of a system in this brand new facility should be problem free. The electrical room is relatively close to the optimal roof section, with several boxes containing any number of spare spaces for circuit breakers (see figure 10) and probably no more that 4 sheet rock walls to run conduit through. The proximity of the meter outside and the spacious size of the electrical room would make it ideal for giving tours.

Fig 16: Side door to electrical room just below optimal roof location for solar panel.

Figure 17: Circuit breaker box with spare breakers

Figure 18: Conduit coming into electrical room

Center is outfitted with high speed internet and therefore compatible with the needs of the Fat Spaniel system.

4.0 Glastonbury High School

Glastonbury High School's new science "A" wing probably offers the most ideal location of all the sites. The roof is served with an enclosed stairwell. The stairwell itself is cordoned off with a gate. This provides not only for convenient, yet secure access for installers and tours. The roof space has no southerly obstructions as shown in figure 20 below and suitable for an array anywhere from a 1 -20 kW array. The school is located in the eastern section of the town, which has better clarity on Google Earth. Therefore an actual image is shown in Figure 19. The suggested location for the array is indicated on the image. The wing is newly opened. The roof type is a rolled roof. The same types of systems as suggested for the town hall could apply to this site.

Fig 19: Location of Glastonbury High School

Fig 20: Panoramic View and Pathfinder of optimal array location on "A" Wing

Fig 21: View of driveway from west side of "A" wing roof showing asy access for crane 4 floors below.

Fig 22: One of two AC outlets on "A" wing roof, close to array site.

Bulk delivery of materials to the roof should not prove any problem. Fig 23 shows just one location where a crane can be set up with little distruption of traffic patterns. There is AC power available in two locations in close proximity to the array location on the roof. This makes potentially makes for convenient penetrations in which to drop the power. Alternative there are stairwells on both the east and west sides of the wings in which to run the power. There are a couple of locations that are probably suitable for electrical interconnection. One could be the main electrical room on the west side of the 1st floor. There an abundance of space in the room. Perhaps more convenient is a secondary electrical closet on the second floor of the east side of the wing.

Fig 23: Conduit running from ceiling into second floor electrical closet.

Fig 24: Several spare breakers available in CB boxes throughout the building.

As with other rooms access to high speed internet is widespread throughout the building.

5.0 Glastonbury New Elementary School

Glastonbury is building a new elementary school that appears to offer solid opportunities for a PV, once it is completed. The site of the school is located in the southwestern section of the town on a reclaimed tobacco field just to the west of the Connecticut River.

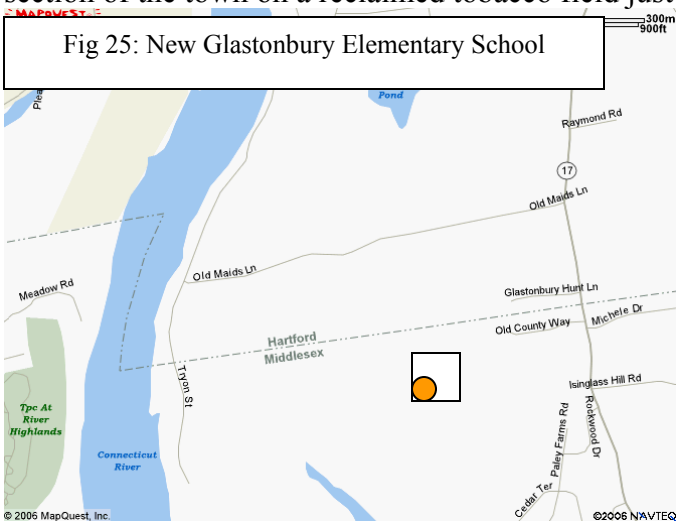

Fig 25: New Glastonbury Elementary School

Completion is slated for summer of 2007. In looking at the site where construction is underway and then looking at the layout drawing, the CCEF consultant identified one of several promising locations for a PV array. On the south side of the building they are putting up a mansard roof at what looks to be a 45° tilt. There is an open field directly to the south. Given the construction that was underway below the roof at the time, the consultant did not layout the pathfinder. This roof is indicated in orange in figure 26. The roof is metal seem as shown in figure 27. Companies such as Uni-rac of Albuquerque, New Mexico make metal seam co-planar mounting hardware designed for a wide range of PV modules. That section is in close proximity to one set of electrical mains and data room in the building as shown in figure 28. Regardless of which site that town decides to deploy the first CEC system, it should consider installing a system at this location and take advance measures, such as running conduit while the building is still in construction.

Fig 26: Mansard Roof over cafeteria

Fig 27: Metal Seam roofing material

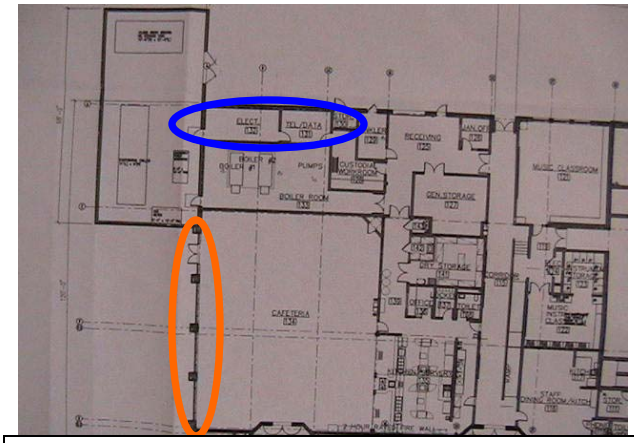

Fig 28: Building plan showing mansard roof (orange) in proximity to electrical and data room (blue)

Conclusions and Recommendations

The Town of Glastonbury provided 2 acceptable prospective locations at the town hall and community center and 2 excellent locations at the schools, although clearly one of them would not be ready for some time. The high school's science "A" wing offers a natural fit for incorporating the PV system into its curriculum. The school roof stairwell will facilitate tours and close inspection of the array. The elementary school offers a location that would be clearly visible from the ground, but not accessible for close inspection.

Once a site has been identified, we recommend that the town contact the roofer for information regarding obligations to maintain warranty. It is also felt that access to electrical connection and capacity in the electrical box should be confirmed for sufficient capacity. Issues regarding access to building steel for purposes of proper grounding should also be checked out. With a system type in mind, depending on the type (e.g. ballasted, penetrations) it is also recommended to check out the loading capacity of the roof with an appropriate expert.