



## Mitchell Associates Architects

# PHASE ONE STUDY PROGRAMMING & SITING UPPER DUBLIN TOWNSHIP

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**MITCHELL ASSOCIATES  
ARCHITECTS**

• EMERGENCY SERVICES FACILITIES •

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29 Thacher Park Road  
Voorheesville, NY 12186  
Phone: 518-765-4571 Fax: 518-765-2950

Email: [Bob@Mitchell-Architects.com](mailto:Bob@Mitchell-Architects.com) Web: [Mitchell-Architects.com](http://Mitchell-Architects.com)

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## **Phase One Study Programming & Siting Upper Dublin Township**

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### **Phase One Study Programming & Siting Upper Dublin Township**

December 19, 2007

#### **Introduction**

The Upper Dublin Township Board of Commissioners has accepted the Facilities Study Report as a basis to select the site for the new main firehouse in the upper-end of the Township. The actual design of the new firehouse will not be as large as initially suggested by the fire company's completed surveys, which determined the design program included in this report. Since the two main sites being considered are in a specific Township Commissioner's ward, two additional residents representing that neighborhood will be added to the Facilities Study Committee in January, 2008 to assist in the selection of the site. The Facilities Study Committee will then make a recommendation to the Board of Commissioners during its February, 2008 monthly meeting. It is anticipated that the Board of Commissioners will select the site during its March, 2008 monthly meeting.

#### **Background**

The Township of Upper Dublin has previously contracted for two studies related to fire protection. In 2005, Design Atlantic and Standing Stone Consulting, Inc. provided a "Strategic Plan for Fire Services." In 2006, Emergency Services Education and Consulting Group (ESECG) provided a "Standard of Response Coverage" analysis.

Both studies called for an analysis of station location and configuration.

#### **Observations from the Standard of Response Coverage Report**

The goal of the "Standard of Response Cover" appears to be stated as follows:

**"Consistent with the acceptable level of risk for life safety within the community, one unit shall respond within six (6) minutes of dispatch, mustering a crew of four (4) qualified firefighters at the scene, upgrading as appropriate, with travel time dependent on traffic conditions. This shall be maintained for 90% of structure fire & rescue calls."**

We will refer to this statement as the *response goal*.

The study carefully evaluated call data for the 47 planning areas within the emergency dispatch Box System as well as highway, rail and pipeline areas within Upper Dublin. The areas were identified as having either a low, medium or high fire-rescue risk level. This information was depicted in a map in a manner that allows simple comparison to emergency response frequency rates, water supply deficiency and road miles and specific area covered by each station (visually determined).

The studies conclusion was that the overwhelming majority of high risk areas are within 1.5 miles of a pumper and 2.5 miles of a ladder truck. That being said, the summary of target hazard locations identifies 23 of the 67 locations (34%) as being outside of the 1.5 mile pumper range. In addition, it appears that sizeable portions of Route 309, as well as portions of Limekiln Pike, Susquehanna Road, Norristown Road, etc. are outside of the 1.5 mile pumper range. We have overlaid the 1.5 mile pumper range over the 2005 and 2006 Emergency Response Frequency Rate maps (2006 is attached). The result reinforces the idea that the Maple Glen area may be inadequately covered.

The deficiency in coverage is not due to the level of volunteer participation or available equipment. The table on page 9 of the Standard of Response report indicates that Upper Dublin has an above average compliment of volunteers and vehicles. The issue is the uneven location of the existing stations relative to need.

The report further states that the land use in Upper Dublin is characterized as “90.5% Developed Land” and 9.5% “Undeveloped Land.” This supports opinions stated that the number of available sites for a new station that are of a reasonable size to allow for future facility growth (our opinion is that this probably means 3 acres or more) is extremely limited.

In February 2007 the Board of Commissioners approved and adopted the Standard of Response Cover for the Fire Suppression Forces of Upper Dublin Township, using the following language

**One unit shall respond by leaving the fire station within six (6) minutes of dispatch and by mustering a crew of four (4) qualified firefighters to the scene of the incident, upgrading for additional apparatus and personnel as appropriate. This standard should be maintained for 90% of structure fires & rescue calls.**

### **Observations from the Strategic Plan for Fire Services**

Some points made in the Design Atlantic study include:

- The existing facilities are in need of improvement, and were listed as a weakness.
- Ventilation (health & NFPA 1500) requirements are being violated.
- The vicinity of the Township building has virtues as a prospective location.
- The Strengths, Weaknesses, Opportunities & Threats analysis (SWOT) indicated some significant threats including property values squeezing out members, loss of experienced and knowledgeable members, increased scope of responsibility, unfunded mandates, loss of control and burnout.

The design Atlantic study set a grossly unrealistic standard when they stated that a new central station could be built for \$800,000 to \$1,400,000. At \$200 per sq ft (2005 costs), this implies a station size range of 4,000 to 7,000 sq ft. The report stated this while recommending that administration, etc. would be located there, and acknowledging that the Summit Avenue station currently has 15,997 sq ft. We hope that this statement has not created an expectation that will be difficult to surmount.

## The Current Study

In late 2006 the Township retained Mitchell Associates Architects to make detailed and comprehensive recommendations reflecting established benchmarks and best practices of the fire service in evaluating the following three issues concerning Type, Size and Location (T.S.L.):

1. Renovate the Summit Avenue main station.
2. Renovate the Summit Avenue main station and build a new sub-station in Maple Glen.
3. Eliminate options one and two and build a new main station on a site in the general area of Fort Washington.

Additionally, it was anticipated that a review of the Burn Brae sub-station would be needed. It was also clearly stated that this study would be directed at an analysis of T.S.L. issues, and would not expand into a specific design of a new station.

To evaluate these three alternatives, the project has proceeded as follows:

1. Programming (user needs) & budget
  2. Determine required building areas for various combinations:
    - a. New main station plus Burn Brae
    - b. Additions and renovations at Summit Avenue plus Burn Brae plus a new sub-station for Maple Glen
  3. Determine if the Summit Avenue site is capable of allowing any additions
  4. Determine the probable parcel requirements for a new main station
  5. Recommend general location for new station and evaluate sites identified by the committee
  6. Determine the probable parcel requirements for a new Maple Glen sub-station
  7. Review Burn Brae and comment
1. **Program & Budget** – Mitchell Associates (and its predecessor firm) has completed programming for in excess of 70 fire station and emergency services facilities. We use proprietary programming tools and techniques developed by us specifically for firematic projects that reflect our specialized knowledge and what we learn from our clients. The program for this project was developed from two in-depth programming meetings with the Facilities Study Committee (Committee) and ongoing support and coordination by Upper Dublin Township Fire Services Administrator, C. Craig Samtmann.
- The program describes firematic and rescue operations, training, security and activities within the building and on the site. It will identify adjacencies, priorities, areas of economy, important response issues, training opportunities and operational efficiencies. It address issues such as meeting, training, communications, SCBA, storage, maintenance, ADA, NFPA 1500 (air quality & fitness training) and future needs such as male, female and student bunking and showering.
  - The program assumes that the Township intends to use the station for many decades, and attempts to forecast future need to avoid creating a building that is out of date the moment it opens.
  - Diagrams are provided to explain individual rooms.
  - Based on the program, a space usage analysis spreadsheet is created that specifies probable room and building size.
  - Utilizing the space usage analysis, we have developed an initial conceptual square foot cost budget that includes site work and building construction.

A facilities study committee was convened with the following members:

- Fort Washington Fire Company, No. 1 (FWFC)- Timothy F. Evard, President; Brian A. Newhall, Chief; Michael P. Duffy, Deputy Chief; Robert L. Toner, Jr., Deputy Chief; Robert G. Lester, Chief Engineer.
- Upper Dublin Township – C. Craig Samtmann, Fire Services Administrator; Timothy P. Schuck, Fire Marshal; and Daniel W. Supplee, Director of Public Works
- Township Resident Advisory Representatives – John T. Losier, 1825 Thornbury Drive, Maple Glen; Nicholas D. Melair, Jr., 1681 Whitehouse Road, Maple Glen.

In March, a 20 page questionnaire was provided to the Committee. Several versions were submitted back to the architect, reflecting the range of ideas among the Committee members. A 5 hour long programming meeting was held with the committee on April 3, 2007. The resulting 1<sup>st</sup> draft program containing text and room diagrams was distributed to the Committee within one week. Marked up drafts were returned to the architect, and a second draft was distributed on April 19, 2007. On May 31, 2007 a follow up programming session was held with the Committee, and a subsequent draft (preliminary to the final) program was issued on June 22, 2007. Comments were offered by C. Craig Samtmann and Upper Dublin Township Manager Paul A. Leonard, and this final draft was issued. The program, area spreadsheet, room diagrams and conceptual budget are attached as Appendix A.

## 2. Determine required building areas for various combinations:

- a. New main station plus Burn Brae
- b. Additions and renovations at Summit Avenue plus Burn Brae plus a new sub-station for Maple Glen

The results of the program are summarized as follows:

|                          | 1st Floor Area | Mezz         | Total Area    |
|--------------------------|----------------|--------------|---------------|
| <b>Area Subtotals</b>    |                |              |               |
| Apparatus Bay            | 8,273          |              | 8,273         |
| Firematic Support        | 2,291          |              | 2,291         |
| Mezzanine                |                | 1,248        | 1,248         |
| Office & Living          | 9,925          |              | 9,925         |
| Walls & Circulation      | 5,040          | 0            | 5,040         |
| <b>Total &gt;&gt;</b>    | <b>25,529</b>  | <b>1,248</b> | <b>26,777</b> |
| <b>Footprint&gt;&gt;</b> | <b>25,529</b>  | <b>0</b>     | <b>25,529</b> |

We have discussed possible construction costs with D'Huy Engineering, Inc. Anticipating a spring 2008 groundbreaking, we expect construction costs to be in the range of \$205 per sq ft for a one story building on a reasonably simple site. Allowing for a 5% contingency, this comes to \$5.75 million for brick & mortar costs. Soft costs cover items such as architecture, construction management, testing, financing, insurances, fixtures fittings and equipment. Soft costs could add an additional 21% to the project cost. Adding a 5% contingency brings the total project cost to \$7 million. A hard & soft cost summary is provided in Appendix A.

### **3. Determine if the Summit Avenue site is capable of allowing any additions**

There is strong sentiment among some FWFC members to remain at Summit Avenue.

The current Summit Avenue station is a 15,977 sq ft building on a 28,500 sq ft (.654 acre) parcel (Building Coverage Ratio = 56%). Even with no additions, for the site to comply with a Building Coverage Ratio of 15%, an additional 78,013 sq ft of land (1.8 acres) would need to be acquired. If Summit Avenue were to meet the new requirements of a main station it would have to comply with the program. The program calls for a total footprint of 25,529 sq ft for a one story building (a 60% increase above the existing). This would occupy 90% of the current site, not accounting for aprons, etc. Based on the Impervious Ratio, and the parking areas determined in the program, the minimum additional land that would need to be acquired would be 4.5 acres.

Alternatively, if a second floor addition were to be chosen, the site requirement would be 2.8 acres based on a 30% pervious coverage in a “B” zone, a 400+% increase in the lot size.

The only way to make the Summit Avenue site work is by acquisition and demolition of adjacent properties. For a one story solution, the acquisition would be 3.8 acres. For a two story solution, the acquisition would be 2.1 acres. For a two story solution, the Township would need to condemn lots 5, 6 and 7 on Fort Washington Avenue as well as lots 15 & 17 on Summit Avenue to acquire the 2.1 acres required to satisfy Township zoning requirements. Additionally, the current station would need to be vacated for more than one year while a second floor is built. A one story solution would require the condemnation of more than twice as much land as the two story addition.

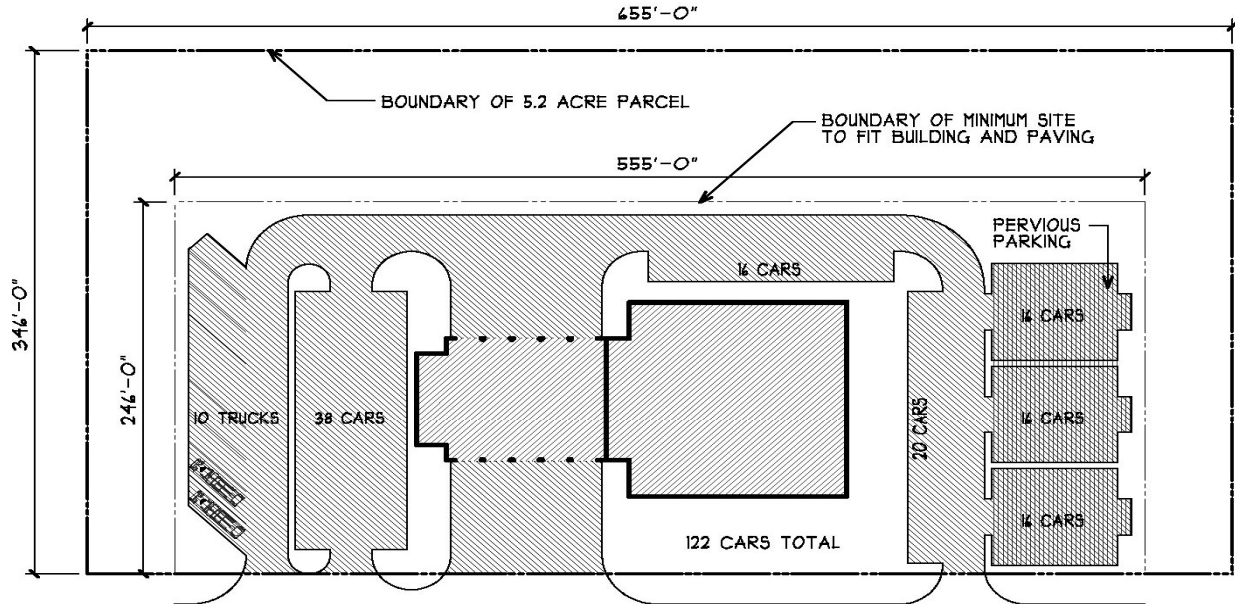
This consultant has concluded that the Summit Avenue station could not reasonably be modified to be a modern headquarters. As a result, task 2,b was modified, limiting the scope to an evaluation of a possible Maple Glen sub-station.

As a final thought, the Summit Avenue station could be contemplated as a sub-station in conjunction with a new headquarters, even though it would not comply with zoning requirements.

### **4. Determine the probable parcel requirements for a new main station**

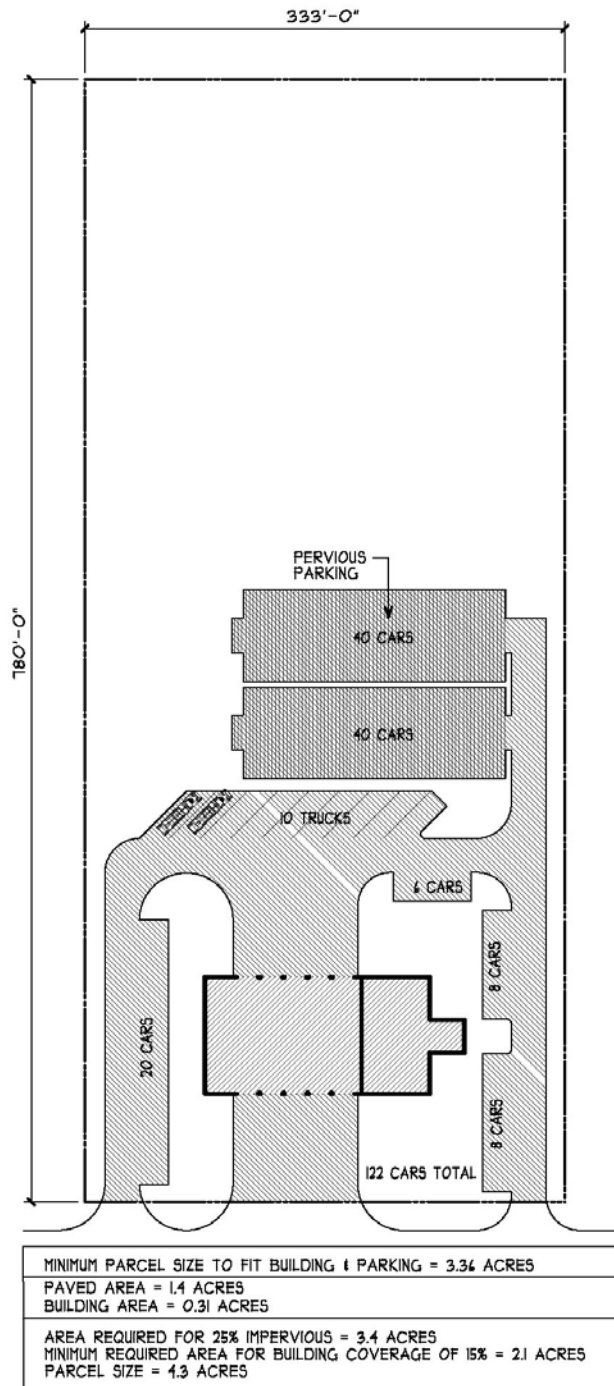
Based on a Building Coverage Ratio of 15% and a building footprint of 25,529 sq ft, a minimum site requirement is 168,393 square feet, or 3.9 acres. However this does not adequately reflect the issue of required parking. Based on the building areas and the building code, the maximum building occupancy is 267. Using a 25% discount for the calculation of cars, we would need to provide for 200 cars. This seems like an improbable quantity. Having said that, with the 25% impervious ratio called for in the A zone, and all parking impervious, this would require a site in excess of 7.25 acres. Upper Dublin Township Director of Code Enforcement, Richard J. Barton, has indicated that the Township would be content with 71 spaces for normal occupancy. Adding 30 spaces for responder parking brings the total to 101. However, this consultant feels based on experience, that 122 spaces is an appropriate amount for the activities contemplated by the building design program. Of that number, 48 spaces reflect “overflow” for special events, and can be pervious. In addition, the Committee called for the ability to park up to ten visiting fire trucks that would be present for training purposes. The result is a 5.2 acre parcel in the A zone, and a 4.3 acre parcel in the B zone. This is illustrated in the following diagram.

**“Typical” Site Plan**



|  |
|--|
| MINIMUM PARCEL SIZE TO FIT BUILDING & PARKING = 3.15 ACRES   |
| PAVED AREA = 1.632 ACRES   |
| BUILDING AREA = 0.595 ACRES  |
| "A" RESIDENTIAL AREAS<br>AREA REQUIRED FOR 25% IMPERVIOUS = 5.2 ACRES<br>MINIMUM REQUIRED AREA FOR BUILDING COVERAGE OF 15% = 4.0 ACRES      |
| "B & C" RESIDENTIAL AREAS<br>AREA REQUIRED FOR 30% IMPERVIOUS = 4.3 ACRES<br>MINIMUM REQUIRED AREA FOR BUILDING COVERAGE OF 20% = 2.91 ACRES |

The Bonsell Nursery parcel represented a special case due to its size limitation (4.3 acres), its narrow and deep shape, and its being surrounded by residences on three sides. As a result, we evaluated a layout based on a two story design, as shown below.



**Bonsell Nursery Site Plan**

## **5. Recommend general location for new station and evaluate sites identified by the committee**

Appendix B contains two maps that address the probable best general location for a new station. The first map is titled "Overlay of 1.5 Mile Response Areas from Standard of Response Coverage Report." This map clearly demonstrates the lack of coverage in Maple Glen. The second map is titled "Full Township Overview of Prospective New Fire Station Locations." This map shows a series of concentric circles starting at ½ mile radius, up to a 1 ½ mile radius. It is understood that concentric circles are not as accurate as response time map outlines. This study does not include response time mapping from the proposed sites. However, the circles give a fairly good representation of what can be expected. It is clear that a station located in planning areas 23, 24, 30, 31 or 32 will provide the best coverage.

The design committee identified seven parcels to be evaluated as prospective locations for a new central fire station, and three for a Maple Glen sub-station. On May 31, 2007 these were visited by the architect and Craig Samtmann. The Township provided general and tax map information as well as zoning information. The sites were evaluated according to the following criteria:

- Size and shape
- Road frontage and access
- Topography (cut & fills)
- Accessibility
- Utilities
- Drainage
- Traffic Separation
- Ease of apparatus access
- Drive-through capability
- Build-ability
- Land available around the building
- Response time
- Extraordinary construction cost
- Acquisition cost
- Potential negative reactions

The response time component is evaluated with regard to the needs identified in the Standard of Response Coverage Report. To that end, we have included (Appendix B) a map locating the potential sites with regard to the emergency response rates from 2006, with the 1.5 road mile response distances from the existing stations. In the rating the sites, response time was given twice the weight of any other individual characteristic.

The physically most attractive sites often come with overwhelming impediments. For example, the site with the highest score is the former Bub Farm. However, this site was removed from consideration by being committed to the parks and recreation department. The second highest scoring parcel, Field of Dreams has significant political impediments.

Location maps identifying all of the sites are attached as Appendix B. Aerial views showing the approximate fit of a fire station are attached as Appendix C. Tables of the results are included in Appendix D.

**Site #1 - Field of Dreams (Main Station – School District Owned)**

The parcel behind the municipal building seems well suited for a fire station due to its size, location and topography given the following considerations:

- a. A new road is anticipated to be built adjacent route 309 running from Highland Avenue to Susquehanna Road. This will allow rapid response without requiring the apparatus to pass through the school zone
- b. The site appears to be well situated for response and coverage of the Maple Glen area, especially considering the new road
- c. The adjacency to the municipal complex will promote a synergy and enhance the sense of shared purpose.

**Site #2 – Rear of Fort Washington Elementary School (Main Station – School District Owned)**

This parcel suffers several significant deficiencies:

- a. The adjacency to the elementary school raises concerns of risk to the students from exiting responding vehicles.
- b. A proposed driveway from the building out to Fort Washington Avenue will increase this risk.
- c. The parcel is very low relative to Highland Avenue, and will require significant expenditures for fill.

**Site #3 – Veterans Memorial Park (Main Station – Township Owned)**

This parcel has 2 major drawbacks:

- a. It is located adjacent homes that would likely object.
- b. The parcel is a former quarry with unknown fill conditions.

**Site #4 – Bonsell Nursery Property (Main Station – Township Owned)**

This parcel Has 2 major drawbacks:

- a. The site requires a two story building with the associated additional construction costs.
- b. The parcel is surrounded by homes on three sides.

**Site #5 – Bub Farm Property (Main Station – Township Owned)**

This property seems very good from the point of view of topography and shape. It has good frontage on Susquehanna Road and is near to the anticipated terminus of the proposed road adjacent Route 309. Although it is adjacent Fort Washington Estates, this may not be considered a drawback. The site appears to be well situated for response and coverage of the Maple Glen area. That being said, the property is no longer in consideration since it has been committed to the Department of Parks and Recreation.

**Site #6 – Mondauk Commons (Main Station – Township Owned)**

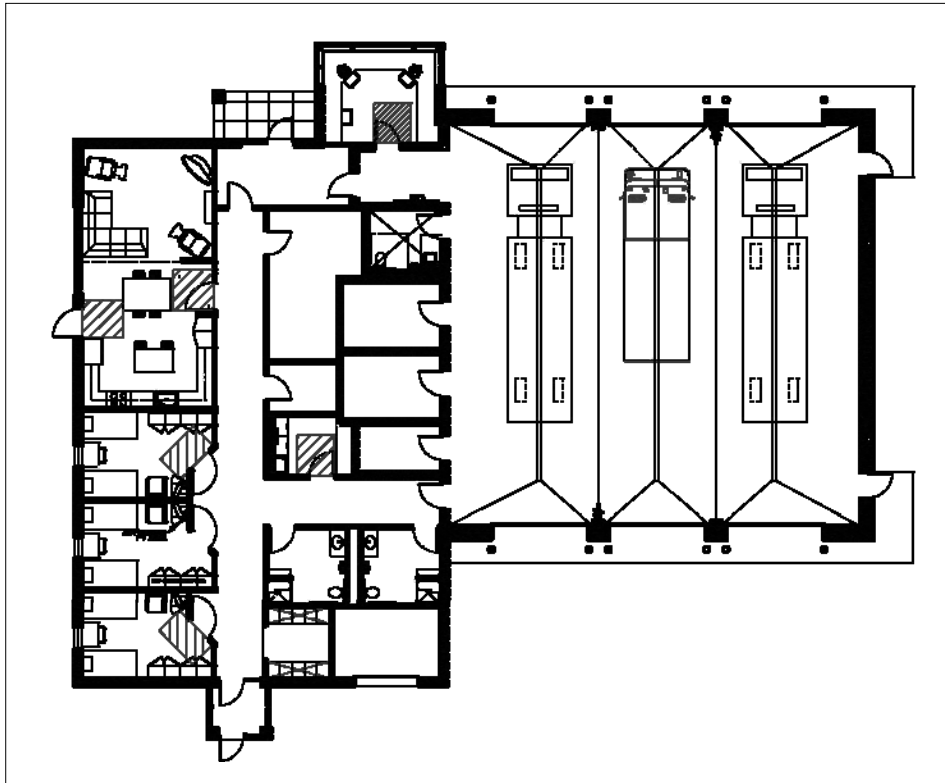
The subject 1.3 acre parcel is the corner of the park bounded by Susquehanna Road and Dillon Road where a parking lot is currently located. Nearly 4 acres would need to be removed from the park, and the walking path rerouted. The parcel has excellent topography & frontage. The site appears to be well situated for response and coverage.

**Site #7 – Nelson Owned Property above the Dresher Triangle (Main Station)**

The subject parcel is located above Dreshertown Road, between Susquehanna Road and Limekiln Pike. Although the site has good physical characteristics, it is poorly located for response. As a main station site, it would imply the elimination of the Burn Brae sub-station.

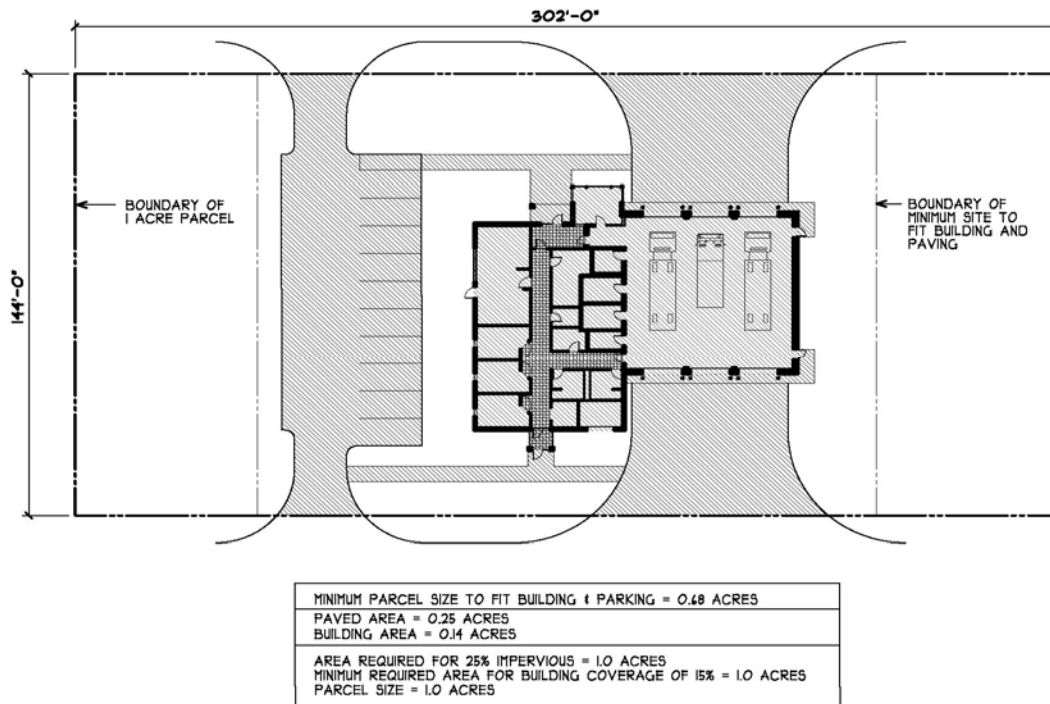
## 6. Determine the probable parcel requirements for a new Maple Glen sub-station

No design criteria have been set for a new sub-station as part of this study. However, the following is a “typical” substation and site, based on our experience. It contains bunkrooms in anticipation of future needs, a day room, and a radio room in additions to apparatus space for three vehicles. We do not presume that this is the correct design, simply a typical design.



**A Typical Substation**

Based on the sample sub-station, we have developed a sample lot layout:



### A Typical Substation Parcel

The prospective sub-station parcels are evaluated against the sample lot layout.

#### Site #8 – North Limekiln Pike near Bell Lane (Sub-Station – Township Owned)

This triangular parcel appears to be difficult to develop:

- a. It is low relative to the road
- b. It appears to be very narrow
- c. The fire station would be very tightly placed adjacent the neighboring dwellings

#### Site #9 - Pileggi Owned Property at 710 North Limekiln Pike - (Sub-Station)

This 6.85 acre parcel is currently for sale. Based on size, location and apparent topography it appears to be an appropriate site.

#### Site #10 - Edwards Fields on Fort Washington Avenue (Sub-Station – School District Owned)

This parcel is located on Fort Washington Avenue between Meetinghouse Road and North Limekiln Pike. The site topography seems appropriate

## 7. Review Burn Brae and comment

We have visited and reviewed the Burn Brae sub-station. The building is sound, attractive, reasonably well laid out and reasonably sited. The building seems to be a good candidate for future renovations and additions as necessary to remain relevant to the changing nature of the fire service. It suffers from a number of initial design flaws and maintenance issues that are resulting in unnecessary deterioration. Photos and notations are included in Appendix E.

## Conclusions

Upper Dublin Township is facing a number of issues with regard to physical plant needs for the fire service.

- Adequate coverage for Maple Glen.
- The out of date conditions of the Summit Avenue station
- The site size limitations of the Summit Avenue station and site

The building(s) that will result from this study will have a potential useful life in excess of 50 years. As such, they must address two major future issues:

- The Township has the opportunity to build a durable, energy efficient and green facility.
- The new station(s) should be designed to accommodate the shifting demographics of the volunteer fire service. Over time, as the cost of living in a community like Fort Washington continues to escalate, the availability of volunteer firefighters will diminish, resulting in a shift to a career department. As noted in the Standard of Response Cover report, the volunteers save the Township approximately \$4,000,000 each year in salary and benefit costs. Clearly, it is in the Townships best interest to enhance recruitment and retention. This can be achieved in several ways:
  - Aggressive and creative recruitment and retention programs (possibly student bunkers)
  - Highly value the volunteers.
  - Provide facilities that are attractive to volunteers and that emphasize training and camaraderie as a recruitment and retention tool.
  - Design into the new facilities the means for the ultimate transition to partial and full career staffing.

## The Building

The first issue examined was what a new headquarters fire station would entail. The program identified a 26,777 sq ft facility with a 25,529 sq ft footprint (one story). We anticipate the total project cost to be in the range of \$7 million. The Bonsell property requires a two story building. It is very early to project the incremental cost of a two story solution. However, we anticipate an increase of between \$100,000 and \$200,000 over a one story building.

If a sub-station is chosen, one could anticipate a building in the size range of 6,250 sq ft (Burn Brae is 4,710 sq ft) at a cost of \$275 per sq ft, for a brick & mortar cost of \$1,700,000. After adding 30% soft costs, the sub-station would cost in the range of \$2.25 million.

In order to justify a sub-station, one would need to determine that the Summit Avenue station could receive renovations and additions. It currently occupies 56% of the site which is well in excess of the mandated Building Coverage Ratio of 15%. Any additions, or for that matter, any attempt to meet zoning requirements would require the acquisition of five or more adjacent properties. Additionally, contemplating adding a second floor at Summit Avenue opens several substantial questions:

- Where will operations occur when construction of this magnitude occurs?
- How will adding a second story solve any of the problems related to the size of the site?

Finally, the per square foot cost of adding a second floor to the Summit Avenue station will be higher than cost of new construction of a one story building. We anticipate that the cost of turning the Summit Avenue station into a 26,777 sq ft two story facility would be in the range of \$6.3 million, plus the cost of acquiring and demolishing the five neighboring properties.

This appears to leave the construction of a new main fire station as the only viable conclusion.

### **The Site**

The former Bub farm turned out to be the parcel with the highest rating for a new central station. It is no longer available.

The available sites are rated as follows:

1. Field of Dreams
2. Bonsell Nursery
3. Veterans Memorial Park
4. Dresher Triangle
5. Rear of Fort Washington Elementary School
6. Mondauk Commons

For a substation, the sites were rated as follows:

1. Edwards Field
2. Pileggi Nursery
3. North Limekiln Pike above Bell Lane

## **Appendices**

**Appendix A – Program, Area Spreadsheets & Budget**

**Appendix B – Location Maps & Tax Maps**

**Appendix C – Aerial View of Candidate Sites**

**Appendix D – Tables**

**Appendix E – Burn Brae Maintenance Report**