

GOLDEN TRIANGLE

SITE PLAN / SUBDIVISION / SPECIAL PERMIT APPLICATIONS
Silver Lake-Scotchtown Road & NYS Route 211

FINAL ENVIRONMENTAL IMPACT STATEMENT

TOWN OF WALLKILL, ORANGE COUNTY, NEW YORK

Tax Map Numbers:

Section 40, Block 1, Lot 16; Section 40, Block 1, Lot 35;
Section 41, Block 1, Lot 45; Section 50, Block 1, Lot 62

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Site Plan / Subdivision / Special Permit
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1.0 INTRODUCTION

This document is a Final Environmental Impact Statement ("FEIS") prepared in accordance with the New York State Environmental Quality Review Act ("SEQRA") and its implementing regulations, 6 NYCRR Part 617. The FEIS consists of this volume, including appendices, and accompanying maps, and the Draft Environmental Impact Statement ("DEIS"), which is hereby incorporated by reference into this FEIS.

The Applicant, Golden Triangle Developers, LLC., requests Subdivision approval to develop a mixed use development on approximately 92 acres of undeveloped land, in accordance with existing zoning, and Site Plan Approval, Special Use permit and wetland permits to develop Phase 1 of the overall Master Development Plan, which currently includes 90 townhouse-style residential units to be built on approximately 19 acres of the property. Full build out of the project site, which is assessed generically in the DEIS because critical details are not yet known, would include a variety of commercial uses consisting of retail, office, hotel, restaurant and other related uses on approximately 74 acres of land.

The site of the proposed project is located northwest of the intersection of New York State Route 17 (future Interstate Route 86) and NYS Route 211 in the Town of Walkkill, Orange County, New York. Exit 120 from Route 17 is located at this intersection. The proposed project is located entirely in the Town of Walkkill and is identified by the following tax map numbers:

- ◆ Section 40, Block 1, Lot 16
- ◆ Section 40, Block 1, Lot 35
- ◆ Section 41, Block 1, Lot 45
- ◆ Section 50, Block 1, Lot 62

Subsequent to the development of Phase 1, a principal component of the Master Development Plan envisioned for this site, is modification of the Route 17 Exit 120 interchange and construction of a new Town road between Silver Lake Scotchtown Road and Route 211. Implementation of the Route 17 Exit 120 interchange modification is a primary objective of the project sponsor and is also the preference of the lead agency, and is key to achieving the commercial development depicted on the Master Development Plan.

There is a pending application for Subdivision and Special Use Permit on the entire Golden Triangle property, as well as Site Plan and Wetland Permit approval for the Phase 1 portion of the project. At present, the Planning Board will not act on portions of the application other than the Phase 1 Site Plan. Remaining portions of the project will be acted upon at such time as a site plan for the remainder of the property has been submitted and reviewed.

The applicant prepared the DEIS for this application based on a written DEIS Scope accepted by the lead agency on March 10, 2003. The lead agency reviewed the DEIS for adequacy with respect to its scope and content for the purpose of public review, and issued a Notice of Completion and Public Hearing dated June 30, 2004. The document was accepted subject to changes reflected in the DEIS dated July 29, 2004. The lead agency held a public hearing on the DEIS, beginning September 15, 2004, adjourned to October 20, 2004, at which time the hearing was closed. The lead agency received written comments during the public comment period, which extended for an additional ten (10) days following the close of the public hearing. Complete copies of all written comments received by the lead agency are included in FEIS Appendix B. Transcripts of the public hearing are included in Appendix C.

In addition, the Town of Wallkill Commission for Conservation of the Environment submitted a letter to the Planning Board dated May 2, 2005, that included its comments and recommendations on the preliminary FEIS. While this letter was received after the DEIS comment period, these comments have been added to this document and responses provided in the respective FEIS sections. The Conservation Commission letter is included in FEIS Appendix B.

Public and agency comments received by the lead agency on the DEIS, together with responses to all substantive comments as required by SEQRA, are provided in this FEIS in comment/response format and organized by subject matter. In some cases, an author's comment may be summarized or paraphrased to clarify its context, and some responses for comments that have been previously addressed in this document refer to the prior response. In Appendices B and C, a reference to the location of the response that addresses each substantive comment is provided in the right hand margin.

FEIS Appendix A includes the latest correspondence regarding the New York State's Department of Transportation's (NYS DOT) support for the Exit 120 Modification Plan and inquiries to local agencies. The applicant will provide the lead agency with responses to these inquiries when they are received.

FEIS Appendix D includes pollutant-loading calculations prepared to demonstrate the reduction of pollutant levels as a result of the stormwater quality management facilities proposed throughout the site. A revised Stormwater Pollution Prevention Plan prepared for the current project plan in accordance with the latest requirements of NYSDEC is included as Appendix E of this FEIS.

Surveys of school-age child populations for other existing projects in the region and a letter from Garling Associates in Goshen, respected planning consultant to many area communities, that pertains to the regional trend in school-age populations are included in FEIS Appendix F.

A summary of an independent review (by Chas. H. Sells, Inc. retained by the Town of Wallkill) of the Wallkill Comprehensive Traffic Impact Study and further analysis of traffic safety concerns is included in FEIS Appendix G.

A set of preliminary site plan drawings for Phase 1 accompany this document, as revised in response to comments received on the DEIS as well as further design development. A minor change in lot size is reflected on the current plan: proposed Lot 1 is ± 19 acres and Lot 2 is ± 73 acres.

1.1 Overall Project Proposal

The Golden Triangle development is proposed as a phased development project.

Phase 1

Phase 1 (Lot 1) is proposed for construction of 90 townhouse-style residential units built in the northwestern corner of the property with two points of access from Silver Lake Scotchtown Road northeast of its intersection with Mud Mills Road. Associated with the Phase 1

development (called “Covered Bridge at Golden Triangle”) will be access-related off-site improvements to provide the following:

- i. At the option of the Town, EITHER a) assist Kabro in the intersection improvements at Mud Mills Road and Cottage Street Extension; OR, b) install a traffic signal at Maltese Drive/Bert Crawford Road intersection (including coordinate timing with Bert Crawford Road/NYS Route 211 signal); OR, c) install a traffic signal at Silver Lake-Scotchtown Road/Bert Crawford Road intersection (including coordinate timing with Mud Mills Road/Silver Lake-Scotchtown Road signal) together with realign Mud Mills Road approach to Silver Lake-Scotchtown Road within the right-of-way, repave with high friction wearing course and remove roadside obstructions.
- ii. Construction of a left turn lane on Silver Lake-Scotchtown Road at the proposed entrance to Covered Bridge at Golden Triangle.
- iii. Road widening of Silver Lake-Scotchtown Road from Mud Mills Road to the northerly proposed site access road (to provide an improved pavement section and remove roadside obstructions), including installation of a sidewalk along the Silver Lake-Scotchtown Road site frontage.
- iv. Modify signal timing at the Route 211/Tower Drive/North Galleria Drive intersection.
- v. A fair share financial contribution toward a future Town project for a double left turn lane on Route 211 at the Route 211/Tower Drive/North Galleria Drive intersection.

A secondary access road to the Phase 1 development is proposed via a paved roadway located in proposed Lot 2 along the future Town road alignment. Phase 1 development does not depend on future development of the remainder of the property or approval of the Exit 120 interchange modifications.

Phase 1 is proposed to connect to existing municipal water and sewer district services nearby.

Full Build Out - Phase 2

Future development of the project site for the commercial phases consists of retail, office, hotel, restaurant and other related uses, which is contingent on the construction of a “connector road” between Silver Lake Scotchtown Road and Route 211. The overall master plan also includes Route 17 Exit 120 interchange modifications on land in the project site. Both of these improvements were the subject of a detailed Traffic Study prepared in the early 1990's and were endorsed by the Town of Wallkill, Orange County, and the NYS DOT at that time. The new Town roadway and interchange modifications were also considered in the NYS DOT Exit 122 Advanced Design Study of the late-1990's. The interchange and “connector road” contemplated in the full build master plan for the subject application will require separate consideration as a highway project at NYS DOT and subsequently at the Federal Highway Administration (FHWA). To that end, the applicant has had ongoing communication with NYS DOT, and will submit an Interchange Modification Report for Exit 120 in the near future, to advance the interchange project. As stated in a letter dated March 18, 2004, contained in FEIS Appendix A, the NYS DOT has indicated the ramp modification project “has benefit and subject to a design review would be approved by the NYS DOT”.

Ultimate future commercial development on the remainder of the site is envisioned to potentially include a maximum of approximately 465,000 square feet of building coverage (approximately 642,100 square feet of total floor area) in a combination of retail, hotel, office, and restaurant uses. This future development of Lot 2 is also proposed to connect to municipal water and sewer district services. Associated with future development on the site will be off-site traffic improvements that are attributable to that development. Appurtenant parking, infrastructure, stormwater management facilities, wetland mitigation and landscaping will be incorporated into the plans for each portion of the project.

1.2 Environmental Considerations

Subsequent to the public comment period, and in response to comments of the Planning Board and public comments received, the following action items have been initiated by the applicant in addition to the Phase 1 related environmental measures included in the project.

- ◆ An evaluation was conducted as to the number of students generated by similar area developments which concluded that the student multiplier used for the Golden Triangle project was consistent with the experience of similar local projects.
- ◆ Town of Wallkill Historian was contacted for relevant historical information pertaining to the Golden Triangle project site.
- ◆ The New York State Office of Parks, Recreation and Historic Preservation has determined there are no significant historical or cultural resources associated with this site.
- ◆ Town of Wallkill Master Plan Committee was contacted with regard to any proposed changes to the current PID Zoning of the project site.
- ◆ Middletown City School District was contacted to inquire about providing school bus service at one or more interior locations in Phase 1.
- ◆ A sidewalk has been provided along the property frontage on Silver Lake Scotchtown Road between the main access and the secondary access road.
- ◆ An internal sidewalk system has been provided in the vicinity of all residential units.
- ◆ The Cabana and Pool to be constructed as part of Phase 1, will be completed prior to the issuance of certificate of the first occupancy for the residential units.
- ◆ A detailed Landscape plan has been developed as part of the site plan package, which includes landscape treatment of the stormwater treatment basins.
- ◆ Lighting for the residential portion of the project is expected to consist of light fixtures on the buildings and shielded street lights at the interior road intersections to provide for public safety.
- ◆ Should the water system connection for Phase 1 of the project to the Tower Drive system not be available in a timely fashion, a connection, with a booster station for fire protection, is proposed to the existing Overhill Road tank system.
- ◆ A nationwide wetlands permit will be filed for from the U.S. Army Corp. of Engineers based upon the revisions made to the plans for required wetland mitigation work and modifications for the new roadwork along Silver Lake Scotchtown Road.
- ◆ The Phase 1 site plan has been revised to preserve a regulated stream on site.

- ◆ Wetland mitigation details are included as part of the site plan package.
- ◆ A detailed stormwater management plan is proposed for Phase 1 to provide water quality treatment in conformance with current clean water standards.
- ◆ Golden Triangle's contributions to improving regional traffic in the project area as part of the Phase 1 proposal will entail the access-related off-site improvements listed in detail above.

2.0 PROJECT DESCRIPTION COMMENTS AND RESPONSES

Comment 2-1 (DEIS Public Hearing, Patricia Owen, Walkkill Conservation Commission, September 15, 2004): I am a member of the newly formed Conservation Committee Board. We were just notified about this. We need a lot more time to study the impacts of it. We have a problem of traffic flow... We are overcrowding now in the Middletown School system... The roads can't handle the traffic - they are not wide enough. They are too busy now. And wetlands... I think the public needs a little more time to study this, as well as our board.

Response 2-1: In response to several public requests for additional time to review the documents, the Planning Board adjourned the public hearing and reopened it on October 20, 2004, for additional public input.

Comment 2-2 (DEIS Public Hearing, Eric Valentin, September 15, 2004): Back in 1989 when they discussed this project ... a resolution was passed ... and it stated that the developer had one year to make an application for special use permit and preliminary approval to the Planning Board. I don't know if they did that.

Response 2-2: The Town of Walkkill Town Board approved a cluster authorization pursuant to §281 of Town Law on May 25, 1989, and a modification of same in 1991, that could be applied to the subject site. However, in November of 2002, the Town Board adopted an amendment to the Town Zoning Code including provisions applicable to the PID zoning district that permits the applicant's current proposal as a special use. (Specifically, the cluster authorization would permit residential building heights of 2½ stories, while the PID regulations prior to amendment required minimum building heights of 6 stories. With the 2002 amendment, buildings 2 to 4 stories are permitted, as are proposed by the applicant.) The applicant's current proposal, therefore, meets the requirements of the Code without the need for cluster authorization.

Comment 2-3 (DEIS Public Hearing, Nina Guenste, September 15, 2004): On the project overview they state the project is located near the major commercial/residential centers of the Town and as such is suitable for a similar type and intensity of development. If you look at the map, it is not near those areas. The only area that is near them is a very small portion of 211.

Response 2-3: In reviewing the overall development patterns in the Town of Walkkill, the majority of residential development is located east of the Goshen Turnpike, along the Silver Lake Scotchtown Turnpike. Commercial and residential development is located along Route 211. Beyond the corridor formed by Silver Lake Scotchtown Road and Route 211, the Town is predominantly rural in nature. The Mills Industrial Park is located between Route 211 and Silver Lake Scotchtown Road to the east of Route 17, whereas the Golden Triangle project is located between Route 211 and Silver lake Scotchtown Road to the west of Route 17.

Comment 2-4 (DEIS Public Hearing, Nina Guenste, September 15, 2004): What they also don't discuss in the DEIS is the air and noise pollution that will happen with Phase II to the residents of Phase I. Are these people going to move into these townhomes thinking they have lovely woods behind them, and all of a sudden there is a commercial development sitting in the backyard?

Response 2-4: *The Draft Environmental Impact Statement addresses both the Phase 1 residential portion of the project and the proposed commercial components of the project in order to inform the public of the entire scope of the project.*

The major traffic improvements that are proposed to provide a new through Town road between Silver Lake Scotchtown Road and Route 211, and an improved Route 17 interchange, will help to alleviate traffic circulation in the area, and associated air quality effects. Based upon the results of the traffic analysis, the greatest potential for project-related air quality impacts would be at the intersection of NYS Route 211 and Tower Drive/North Galleria Drive due to the vehicle delays projected at this intersection. However, given the proximity of this intersection within the Route 211 and Route 17 traffic corridors and the project site, which borders these corridors, the worst case air quality impacts associated with the proposed project, are expected to be well below ambient air quality standards. Thus, the proposed project is not expected to result in adverse air quality impacts to the general public, including persons in vehicles traveling in the area, existing residents in the site vicinity, and new residents of the Covered Bridge at Golden Triangle.

Comment 2-5 (DEIS Public Hearing, Doug Dulgarian, Walkkill Planning Board, September 15, 2004): If that [through] road doesn't happen ... are we looking at this 300 townhome Alternate Scheme 3?

Response 2-5: *Phase 1 of Golden Triangle is the residential portion of the project. The residential portion of the project as proposed is for construction of 90 townhouse units. This portion of the project is independent of the new Town Road. The Master Plan for this project as proposed is for commercial development of Lot 2 and includes the new Town Road and Route 17 Exit 120 Interchange Modification.*

Alternative 3 for 300 Townhomes was included under SEQRA regulations to demonstrate other possible scenarios for development. Any future project, other than the one proposed would be subject to further site plan review by the Town Planning Board.

Comment 2-6 (Letter #4, Salvatore J. LaBruna, Walkkill Conservation Commission, Undated): This project has not been referred to the Orange County Planning Department. According to the department's commissioner, David Church, "to the best of our knowledge, we have yet to receive a referral for advice or formal review as required on any recent proposal and/or environmental impact statement." The Planning Department is the most qualified agency to judge the project's potential cost to community services and they should be given an opportunity to do so.

Response 2-6: *A copy of the accepted DEIS was received and signed for by representatives of the Orange County Planning Department on August 6, 2004. A copy of the mail receipt is included in Appendix A, Correspondence. The applicant contacted Mr. Richard J. Jones, a Senior Planner for the Orange County Planning Department on March 2, 2005, who indicated the Department had received the DEIS and has no comment on the document. A copy of Mr. Jones' letter is included in Appendix A.*

The proposed Master Development Plan for Golden Triangle conforms with the Orange County Comprehensive Plan's vision of developing the subject site into a combination of

major commercial uses at the southern portion, and medium density residential and conservation land at the northern portion of the site, and interconnecting Route 17 (future Interstate Route 86) with Route 211 and local streets via Silver Lake Scotchtown Road. The Golden Triangle plan will provide linkages for transportation routes in the immediate vicinity, a mix of land uses that includes business facilities and housing in close proximity to complementary uses, and linkages of natural open space areas such as wetlands.

Comment 2-7 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The DEIS does not give a detailed description of a proposed approach for maintenance of the stormwater facilities. This is an important issue since any anticipated pollutant removal performance will hinge on future maintenance. The applicant should propose a mechanism for this. If it's the homeowner association's responsibility, there should be some provision for the Town to step in and perform the maintenance and get their expenses recouped if the association fails to do it.

***Response 2-7:** Responsibility for maintenance of the stormwater facilities will be rest with the Homeowner's Association as part of the Landscaping and Grounds Maintenance for the project. A copy of the Homeowner's Association Agreement including maintenance enforcement provisions will be subject to review by the Town Planning Board as part of the site plan approval process.*

Comment 2-8 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The Town of Walkill Historian Dorothy Hunt-Ingrassia was not contacted for the Cultural Resources Survey. Contacting the historian should have been the first step for the cultural resources consultant. A town historian is the unique position of having access to traditional historical data not found in the texts cited by the consultant.

***Response 2-8:** A substantive history of the Town of Walkill, prepared by Town Historian, Dorothy Hunt-Ingrassia is displayed on the Town Website. The website was reviewed as part of the Cultural Resources research. The Town Historian has been contacted for any additional historical input which may pertain to the Golden Triangle Project. A copy of this letter is found in Appendix A, however no response from the Town Historian has been received as of the date of this document. The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) determined there were no significant historical or cultural resources in proximity to this project, a copy of the OPRHP letter is included in Appendix A.*

Comment 2-9 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The ongoing Town of Walkill Master Plan review should be completed so this board can be certain the property will remain zoned as Planned Interchange Development. However, a guarantee from the Master Plan Review Committee that the project site will remain zoned PID would be sufficient.

***Response 2-9:** A letter has been sent to the Town of Walkill Master Plan Committee to determine if there are changes anticipated to the zoning of the subject parcels. This letter is included in Appendix A, Correspondence. No response to this letter has been received as of the date of this document.*

Comment 2-10 (DEIS Public Hearing, Nida Guenste, October 20, 2004) Regarding the DEIS statement that the development is compatible with its surroundings and a similar type intensity. If you look at the site, the pink is all residential. The yellow across the highway is PID. and they only have approximately 200 or 300 feet bordering the PID area.

***Response 2-10:** As can be seen in the zoning map DEIS Figure 3.7-1, the entire length of the easterly project boundary is Route 17, the westerly boundary of the site is along Silver Lake Scotchtown Road. The southerly boundary of the site is located adjacent to the Route 17 interchange ramps, and the existing connection to Route 211. The Phase 1 residential portion of the project is located in the northern western portion of the project site in the vicinity of the intersection of Silver Lake Scotchtown Road and Mud Mills Road. DEIS Figure 3.7-1 shows the lot lines for the residential development in this area. This medium density residential development proposed by Golden Triangle will serve as a transition between the surrounding residential development toward the northern portion of the project and the proposed commercial development within Golden Triangle.*

Comment 2-11 (DEIS Public Hearing, Salvatore LaBruna, October 20, 2004): I am a member of the Conservation Commission. I just wanted to talk briefly about a couple of things in our comments; number one, about referral to the County Planning Department. I feel pretty strongly that this project ought to be referred to the County. I am not sure, I know in the EIS, it did list the County Planning Department as one of the bodies that would be notified on the project, but as far as I know from the chairman, they haven't received anything and haven't had a chance to really look over the project. I think it would be beneficial for everyone involved if they had an opportunity to comment.

***Response 2-11:** A copy of the mail receipt to the Orange County Planning Department Commissioner, David Church, has been included in Correspondence, Appendix A. The applicant contacted Mr. Richard J. Jones, a Senior Planner for the Orange County Planning Department on March 2, 2005, who indicated the Department had received the DEIS and has no comment on the document. A copy of Mr. Jones' letter is included in Appendix A.*

Comment 2-12 (DEIS Public Hearing, John Paul Urich, October 20, 2004): I read the DEIS, and I didn't see much about lighting, or maybe I missed that, but I think the Planning Board needs to look at that. there is a lot of light pollution right now from the Galleria.

***Response 2-12:** Lighting for the residential portion of the project is expected to consist of light fixtures on the buildings and ornamental street lights at the interior road intersections to provide for public safety.*

A lighting plan will be included as part of the site plan for the full build out commercial portion of the project and will include ornamental lighting fixtures.

Comment 2-13 (Letter #7, Town of Wallkill Conservation Commission, Salvatore J. LaBruna, May 2, 2005): Although we have a few issues with Phase I of this project, at the time our primary concern with the Final Environmental Impact Statement for the Golden Triangle project is the limited amount of information available on the second development phase. The environmental impact of the commercial development is essentially limited to a statement in the second paragraph of the introduction which states, "Full build out of the project site, which is addressed generically in the DEIS because critical details are not yet known, would include a

Project Description

February 7, 2006

variety of commercial uses consisting of retail, office, hotel, restaurant and other related uses on approximately 74 acres of land." The proposed commercial phase of this project will expand an already existing corridor of sprawling commercial development into an area that is primarily residential, currently undergoing alarming growth, and already facing traffic issues. Massive chain stores, hotels and restaurants surrounded by acres of parking are traits often associated with auto-oriented development that is commonly referred to as sprawl.

The Conservation Commission would like the applicant to consider a number of different options for the final development phase of the site. The project sponsor has the opportunity to create a more community friendly development by taking advantage of compact building design, using smaller setbacks, locating shared parking behind buildings, and expanding a network of internal sidewalks and crosswalks. The Master Plan Review Committee is currently debating the creation of "Town Center" zoning surrounding the new Town Hall government complex which would utilize some of these principles. The area, labeled "The Mills Industrial Park" in the FEIS, is located directly across Route 17 from the Golden Triangle site and also features a Route 211-Silver Lake Scotchtown connector road (Tower Drive), like the one proposed for this project. The Golden Triangle might benefit from a similar development scheme. When this project returns to the Planning Board for site plan approvals for the second development phase, we would like the applicant to submit any preliminary sketches to the Conservation Commission in an effort to work together with this organization, the Planning Board, and the Town Engineer to create a better project for the applicant and the community.

Response 2-13: *The applicant acknowledges that it will consider design alternatives for the development of the remainder of the project site that may include the ideas offered by the Conservation Commission, such as a compact site design that shares parking and provides pedestrian connections. Provisions that are detailed in the new Town Comprehensive Plan that are applicable to this site, as well as the requirements of zoning that are in place at that time, will be incorporated into the plan. When the applicant returns to the Planning Board for site plan approvals for the development of the remainder of the property, a preliminary site plan will be reviewed by the Planning Board and its consultants and advisors with these comments in mind. It is expected that the Town Conservation Commission will take an active part in the review of the plans.*

3.0 WATER RESOURCES COMMENTS AND RESPONSES

Comment 3-1 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): Given that approximately 52 acres of the project site will be covered with impervious surfaces, stormwater runoff is another area of serious concern. The Executive Summary of the DEIS notes that the basins to be employed are designed to remove 80% of suspended solids from runoff after site stabilization. It should also be noted in this context that the practices in New York State's Design Manual typically remove in the range of 40 to 60% of *dissolved* pollutants. Since developments of this nature can increase pollutant loadings greatly compared to pre-development levels and that many of the pollutants of concern occur in the dissolved form, significant increases in pollutant export can potentially be expected from such sites even after runoff passes through a stormwater management practice. At this point we would like to point out that runoff from this site will enter Silver Lake where overflow will then drain into the Walkill River and ultimately end up in the Hudson River.

Response 3-1: Although not required by the NYS DEC for stormwater discharges, pollutant-loading calculations have been prepared and are included within Appendix D. The reduction of pollutant levels as a result of the treatment within the acceptable stormwater quality management facilities proposed throughout the site is indicated within the tables. The stormwater facilities have been designed to meet all NYS DEC requirements for stormwater treatment, including an 58% reduction in total suspended solids (TSS) and a 66% reduction of total dissolved solids (TDS). Through the use of SMP's, TSS in the developed portion of the site will be reduced from 1,341 lbs. pre development to 553 lbs. post development, a 59% reduction. TDS will also be reduced post construction through the use of SMP's from 10,475 lbs. to 3,493 lbs. a 66% reduction. The construction of water quality facilities for the proposed site include bioretention areas, dry swales and wet basins that will effectively reduce the amount of pollutant loading for TSS and TDS from the site. This reduction is attributed to the construction of the infiltration and filtering practices for water quality throughout the site. Higher sediment and pollutant loadings occur during the small hydrologic storms (1-Year) that the proposed water quality facilities will attenuate.

The remaining balance of the property, which at this time is not proposed for development, must provide the same stormwater facilities to treat water quality. The future facilities will be constructed to meet the future requirements for stormwater runoff.

Comment 3-2 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The DEIS seems to indicate that large storm *quantity* control will not be required, and only *quality* control for smaller storms will be put into place. The DEIS justifies the lack of quantity control by claiming the "peak" output from this site will pass through Silver Lake before the peak from the entire Silver Lake watershed reaches that body of water. The time difference in these peaks, based on hydrology computer models, is about one hour. However, models are idealized representations of the way rainfall comes and the way runoff occurs. We recognize that use of these models is accepted for this purpose, but it should be remembered that there are many variables that could impact the timing and nature of peak flows. There are additional concerns beyond just the timing of the peak. The overall volume of runoff relative to infiltration will be shifted significantly. We believe the most effective way to deal with these potential changes in runoff patterns is to mimic the pre-development runoff patterns as closely as feasible using a combination of stormwater management practices on the site. This approach

might be considered beyond the minimum New York State requirements, but is not unreasonable given the size and nature of this project.

Response 3-2: *As per Section 4.8 of the NYSDEC Stormwater Manual, a downstream analysis was prepared to determine if the site meets the requirements for having no water quantity facilities on site. The conclusion of the analysis is that each element required for the exemption has been met and detaining runoff is not required. The criterion consists of the following conditions: First, compute the pre and post development peak flows for the design storms (10 & 100 year) at the downstream confluence including 10% of the site area with scenario's for both post development with detention and without detention. Second, analyze the hydraulic effects of any culverts or downstream obstructions. Finally, assess the water surface elevations to determine if an increase in water surface elevations will impact existing buildings or structures. The proposed project occurs close to a large body of water downstream and adjacent to a significant stream or river. The site is located North of Silver Lake, which is approximately 32 acres in size that directly receives runoff from a 7,600 acre watershed. Also, the Masonic Creek traverses the Southwestern portion of the site where it directly discharges into Silver Lake. The analysis determined that by detaining the higher hydrologic storms this creates a higher peak discharge and volume, which is detrimental rather to delay release can coincide with the peak storm flow from the upgradient portions of the watershed. Please refer to the Stormwater Pollution Prevention Plan for specific details and calculations of the analysis. The large storage volume provided by Silver Lake and the Masonic Creek will assure no measurable increase in the water surface elevation of Silver Lake or the maximum storage volume. Runoff associated with the water quality storm will be routed to the proposed facilities throughout the site for pollutant removal and infiltration.*

In summation, the analysis provided that with stormwater detention on site the peak discharge for the site would be higher than the peak discharge of the site without detention. The hydraulic analysis of the downstream culverts provided they are adequate to handle the peak flow without detention because the site discharge does not coincide with the watershed peak discharge. An assessment of the water surface elevation of Silver Lake provided that the elevation without detention would increase less, than with detention provided.

To better facilitate pre-development runoff patterns the proposed water quality facilities were designed to maximize infiltration of the 1-year storm back into the soil while diverting the higher storm to the Masonic Creek and Silver Lake. This design is consistent with pre-development conditions by promoting infiltration of the smaller hydrologic storms and at the same time enabling the higher hydrologic storms (10 & 100 year storms) to be undetained and discharged into the adjacent wetlands and Masonic Creek. The present plan proposes to utilize a combination of stormwater practices to infiltrate runoff specifically using bioretention areas and dry swales throughout the site. These types of facilities are accepted practices for stormwater treatment by the NYSDEC.

Comment 3-3 (Letter #7, Salvatore J. LaBruna, Walkill Conservation Commission, May 2, 2005): In response to our previous comments, the applicant has included pollutant-loading calculations for stormwater discharges in an appendix to the FEIS. The project sponsor also reports that the stormwater management practices chosen for this site will result in a 59%

reduction in total suspended solids (TSS) and a 66% reduction of total dissolved solids (TDS). The documents does not clearly state if this represents a reduction from the developed site without stormwater controls, or compared to existing undeveloped conditions. If the reduction were based solely on the use of stormwater management practices, this would still represent an overall increase from existing conditions and should be clearly indicated. If the developed site with controls will result in a reduction compared to the undeveloped site, this calls for a detailed explanation. Furthermore, there is no discussion of the significant increase in both nitrogen (TN) and phosphorous (TP) levels in the effluent. The amount of TN will increase from 59.86 to 139.79 (no units specified, but we believe this is pounds annually.) The amount of TP will increase from 3.70 to 9.78. On a percentage basis this appears to be a substantial upsurge. These two substances are strongly linked to the growth of algae blooms in many bodies of water, and in this case may represent a potential risk to Silver Lake. The effect of this project viewed in isolation might not be significant, but the cumulative effects of this and other pending projects in the Silver Lake watershed, including some that may not have been required to comply with new stormwater regulations, are a serious concern.

The applicant should study the potential threat posed by increased levels of both nitrogen and phosphorous in the effluent, specifically whether the amounts indicated in the pollutant-loading calculations could lead to the formation of toxic algae blooms in Silver Lake. The FEIS should also clearly explain how and why the TSS and TDS would differ from existing conditions.

Response 3-3: *As requested, the pollutant loading calculations have been revised to further diminish the amount of pollutant export from the site. The stormwater facilities on site have been redesigned to provide NYSDEC approved practices in series. The site will be constructed with sand filters and bioretention areas in several locations. The addition of dry swales will help aid in reducing the pollutant export.*

Overall, the practices placed in series will reduce the Total Suspended Solids (TSS) in the developed portions of the site from 625 lbs/yr pre-development to 60 lbs/yr post-development, a 90% reduction. Total dissolved solids (TDS) will be reduced from 5,087 lbs/yr pre-development to 588 lbs/yr post-development, an 88% reduction. The pollutant loadings for metals (copper and zinc) will not increase. In conformance with current regulatory requirements, pollutant loadings for total phosphorous (TP) and total nitrogen (TN) in treated stormwater from the site decrease when compared to post-development conditions without stormwater treatment. Total phosphorous is reduced by 66% and total nitrogen is reduced by 70%. However, the post-development values for these two constituents slightly increase as compared to pre-development values. The TP is calculated to increase by 4.9 lbs/yr and TN has been calculated to increase by 11.2 lbs/yr. These values in comparison to pre-development values would seem to greatly differ. However, a comparison to the overall watershed for Silver Lake indicates that the minor increase expected from the post-development site is negligible. When compared to the overall Silver Lake watershed, the slight increase for Total Phosphorous amounts to a 0.59% increase. Calculated Total Nitrogen values show a slight increase of 0.06%, an immeasurable amount. The utilization of the aforementioned practices in series far surpasses any current regulations set fourth by the NYSDEC for stormwater discharge from new development.

The balance of the property, which at this time is not under site plan review, must provide the same types of stormwater facilities for treatment of water quality. Future facilities shall be constructed to meet any requirements for stormwater runoff at the time of design. The future site, where possible, shall construct bioretention and surface sand filter areas for stormwater management as long as they are still an accepted NYSDEC practice.

Refer to FEIS Appendix D for additional information on the the pollutant loading calculations.

4.0 ECOLOGICAL RESOURCES COMMENTS AND RESPONSES

Comment 4-1 (DEIS Public Hearing, Nina Guenste, September 15, 2004): They are talking that this site will have to be totally ... graded and all natural habitat will be gone from the area. I don't know what research they did. They also state the extent of wetland disturbance and wetland compensation that would accompany the full build plan is not known at this time. They don't show the stream that runs into Silver Lake on their plans for their development. I don't know if they have taken it into effect, but I have looked at the maps in the DEIS and it's not located on any of the maps there. And this is a major stream that runs through the area and through the property. And if you are talking about taking away the wetlands ... and covering the majority of that site with cement, I can't see how it cannot have an impact, and a negative impact. Water run-off that goes into the ground ... where is it going to go; is it going to go down to the stream and then into the water to Silver Lake?

Response 4-1: *The proposed development in Phase 1 involves disturbance to 11.4 acres of wooded land. The full build development, which would be done incrementally over time, could disturb approximately 67.6 additional acres. The site specific plan for the commercial portion of the project, however, is not yet developed and will be subject to further review and approvals.*

With full development, the project site would retain no less than 16 acres of existing natural vegetation. The Phase 1 portion of the proposed development involves 0.38 acres of wetland disturbance and 0.82 acres of wetland mitigation as shown on the current full-size Wetland Mitigation plan. The wetland mitigation for the Lot 2 portion of the project will be designed to provide a similar 2:1 compensation ratio. The details of the wetland mitigation for the Lot 2 portion of the project will be prepared along with the detailed site plan for that portion of the project. The commercial portion of the master development plan for the site will be subject to additional review and approvals.

The stream that flows from the project site under the railroad tracks towards Silver Lake is shown on the full-size plans (see Silver Lake Drainage" plan). This stream is identified in the engineer's drainage report as "Discharge Point B" (see DEIS Appendix E). This stream would not be disturbed by the Phase 1 portion of the project. The potential impacts to drainage and this stream by the full build project will be analyzed and evaluated when that phase of the site plan is developed in detail. These impacts will be subject to further review and approvals with regard to stormwater management and wetlands mitigation.

Comment 4-2 (DEIS Public Hearing, Nina Guenste, September 15, 2004): They say in the DEIS ... the loss of upland habitat is unavoidable, but they are going to use trees and landscape buffers. Some of the trees on that property are probably 75 feet tall, if not taller, and that takes a long time for them to grow back.

Response 4-2: *Comment noted. The proposed development will change the character of the project site from its current wooded condition to a developed condition. The proposed landscape vegetation within the developed portion of the site will replace the existing woodland trees with shade trees, buffer trees, and other landscaping that will complement the developed project plan. The trees on the remaining woodlands on the site (in the wetlands and buffer areas and around the perimeter of the property) will continue to grow and mature over time.*

Comment 4-3 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The DEIS indicates, though we strongly disagree, that the project “will help alleviate traffic circulation in the area, and associated air quality effects,” yet there is no mention of the effects of clearing 96 acres of woodland will have on air quality. For those living in the Silver Lake area, the undeveloped site currently acts as a buffer against noise and air pollution emanating from Route 17. These conditions should have been addressed or at least mentioned in section 3.3 of the DEIS entitled “Air Resources.”

***Response 4-3:** The closest existing homes in the Silver Lake community to Route 17 are located approximately ¼ mile to the west, with most homes considerably further. Given the distance and the fact that prevailing winds blow from west to east, the air emissions from mobile sources on Route 17 (cars, vans, and trucks) are likely to have no significant effect on the Silver Lake community, as most emissions will disperse into the air towards the east.*

The visual and noise attenuation benefits that the existing trees on the site provide to the Silver Lake community are not expected to be significantly altered by the full development of the proposed development, which would retain approximately 16 acres of existing natural vegetation. This vegetation, in combination with the intervening topography, off-site vegetation and the distance from Route 17, will continue to provide significant visual and noise attenuation benefits. The buildings proposed on the project site will also provide some noise barrier benefits to the Silver Lake community by absorbing and reflecting highway noises emanating from Route 17.

Comment 4-4 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The USDA Soil Survey shows significant areas of “hydric” soils on the project site. Hydric soils are likely to meet the federal criteria for wetlands. The applicant has apparently conducted on-site wetland mapping which normally would be expected to be more accurate than the Soil Survey. It is difficult to further evaluate any potential discrepancy between the Soil Survey and the applicant’s mapping without reviewing a more detailed map of their wetland delineation. The DEIS notes that a jurisdictional determination from the Army Corps of Engineers had been requested. If additional attention to this matter is deemed prudent, the Town may wish to request that ACOE include a field visit in their review of the applicant’s delineation.

***Response 4-4:** The site was visited by Mr. Orzel on July 24, 2002 and plans showing the wetland boundary as surveyed by Mr. Orzel were sent to his attention on October 10, 2002. The current site plan shows the wetland boundary as field verified by Mr. Orzel, and represents the wetland boundary approved by his office in its letter dated July 15, 2005 (see letter in Appendix A).*

Submissions of the Phase 1 portion of the project, requesting a Nationwide Permit (NWP), were made to the ACOE in January 2005 and again in May 2005, on revised site plan, showing revisions made to accommodate requirements of the ACOE and the proposed new roadwork on Silver Lake Scotchtown Road. In its July 2005 letter, ACOE accepts the applicant’s wetland boundary location map and acknowledges that the proposed activities of Phase 1 can be accomplished under NWP #39 without further authorization from ACOE, based on the project wetland impact and mitigation plans submitted and the conditions of the General Permit. Special conditions also apply that

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require annual reporting to ACOE for five years following installation of the wetland mitigation plan.

5.0 TRAFFIC COMMENTS AND RESPONSES

Comment 5-1 (DEIS Public Hearing, Eric Valentin, September 15, 2004): I would like to know what time they did the traffic study. Is it current? Is it taking into consideration the already approved projects for that area? And already being built projects for that area?

Response 5-1: *Data for the Traffic Study was collected by representatives of John Collins Engineers during January, March and April of 2003 during the AM and PM peak hour periods of 6:30 to 9:00 AM and 4:30 to 7:00 PM. The data was supplemented with data obtained from the New York State Department of Transportation.*

As part of a comprehensive traffic study for the area, fourteen intersections in the project vicinity were evaluated for operating level of service. The scope of the traffic study was identified by the Town of Wallkill Planning Board based upon input from the Town Engineer. The intersections are shown on Figure 3.6-2 of the DEIS and listed below:

- NYS Route 211 & Silver Lake Scotchtown Road
- NYS Route 211 & Bert Crawford Road/Dunning Road
- NYS Route 211 & NYS Route 17 EB On Ramp
- NYS Route 211 & NYS Route 17 WB On/Off Ramp
- NYS Route 211 & Tower Drive/North Galleria Drive
- Silver Lake Scotchtown Road & Bert Crawford Road
- Silver Lake Scotchtown Road & Mud Mills Road
- Silver Lake Scotchtown Road & Tower Drive
- Mud Mills Road & Cottage Street Extension
- Silver Lake Scotchtown Road & Neeley Street
- Silver Lake Scotchtown Road & Maltese Drive
- Bert Crawford Road & Maltese Drive
- Tower Drive & Industrial Drive
- Wisner Avenue & Cottage Street Extension

The study took into account nine projects that are currently planned in the area, including Golden Triangle Phase 1. Table 3.6-3 of the DEIS provides a list of the projects either approved or pending in the immediate area. The location of these projects is shown on Figure 3.6-3 in the DEIS Traffic section, and listed in Table 3.6-3. Table 3.6-3 from the DEIS is shown below.

Recently, the Town of Wallkill Town Board retained Chas. H. Sells, Inc., to perform an independent review of the Wallkill Comprehensive Traffic Impact Study. In particular, the Sells review included an analysis of roadway safety and evaluation of the ability of the roadway segments connecting the study intersections to safely accommodate increased volumes of traffic. As concluded in its September 22, 2005, memo to the Town,¹ Sells states that the improvements proposed as part of the Wallkill Comprehensive Traffic Impact Study taken together with the additional recommendations of Sells will provide the Town with a roadway network that will operate at acceptable levels of service, while also addressing the contributing factors to the high accident locations that may be exacerbated by the increased demand from the projects currently in front of the

¹ Chas. H. Sells, Inc., Memo to John F. Ward, Town Supervisor, dated September 22, 2005. (See FEIS Appendix G)

Planning Board. A summary of the Sells review of the Wallkill Comprehensive Traffic Impact Study is included in FEIS Appendix G.

DEIS Table 3.6-3 Pending Projects Town of Wallkill			
Project Name	Number & Type of Units	General Location	Access
Lakeview Estates	9 Single Family Subdivision	West of Bert Crawford Road	Bert Crawford Road
Gutterman	12 Single Family Subdivision	North of Silver Lake-Scotchtown Rd	Silver Lake-Scotchtown Rd
Dupee	30 Condominiums	North of Silver Lake-Scotchtown Rd	Silver Lake-Scotchtown Rd
MKA	182 Single Family 160 Multi Family Apts.	North of Cottage Street Extension	Cottage Street Extension & Highland Avenue
Tower Ridge	192 Multi Family Apts.	East of Tower Drive	Tower Drive
Golden Triangle Phase 1	96 Townhouses	South of Silver Lake-Scotchtown Rd	Silver Lake-Scotchtown Rd
Wallkill Manor	104 Apartments	North of Silver Lake-Scotchtown Rd	Silver Lake-Scotchtown Rd & Second Street
Kabro	283 Age Restricted Units	South of Cottage Street Extension	Cottage Street Extension
Scotch Valley	55 Single Family Subdivision	North of Silver Lake-Scotchtown Rd	Silver Lake-Scotchtown Rd

Source: John Collins Engineers PC, 2003

Comment 5-2 (DEIS Public Hearing, Nina Guenste, September 15, 2004): In their site area description they refer to Route 211. Route 211 is not near that site - it has a very small portion. And when I talk to the DOT they talk about removing different entrances and exits off of 211. So instead of having traffic congestion on Tower Drive, we are going to move it across town to the other end of Tower Drive, so the people that used to go from different areas on 211 from both directions are now going to be funneled into this one area.... Not only do you have 98 apartments (that) have been approved, you also have Kabro with 256 units right up Mud Mills Road. So you are talking heavy traffic congestion that really needs to be looked at. I have sat at Tower and Scotchtown Road for 5 minutes waiting to get out at 3:00 in the afternoon, and that's not morning rush-hour.

Response 5-2: The Wallkill Comprehensive Traffic Impact Study investigated 14 area intersections including the intersections of Route 211/Tower Drive and Tower Drive/Silver Lake-Scotchtown Road. In this study the traffic impacts of nine pending projects including Golden Triangle Phase 1, were assessed for operating levels of service. The Wallkill Comprehensive Traffic Impact Study identified regional traffic improvements that would be necessary to maintain acceptable levels of service within the local traffic network. In cooperation with the project sponsors, the Town Planning Board assigned responsibility for the improvements identified to the various project sponsors. Table 3.6-4 from the DEIS listed the intersection, the improvement necessary and the project responsible for making the improvement.

Recently, the Town Board retained Chas. H. Sells, Inc., to perform an independent review of the Wallkill Comprehensive Traffic Impact Study and additional traffic improvements were recommended based on further analysis of safety concerns. As a

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result of that analysis and the developer's agreement between the Town and MKA, the MKA project will perform road widening, including turning lanes, in conjunction with the installation of a traffic signal at the Silver Lake-Scotchtown Road/Tower Drive intersection. DEIS Table 3.6-4 is shown below and is revised to include the recommendations of Sells. Signalization of this intersection will improve operating conditions to a level of service C or better. (All off-site traffic improvements proposed as part of Golden Triangle Phase 1 are listed in FEIS Section 1.2.)

A summary of cost estimates for the traffic improvements that were attributable to the various area projects was assembled as part of the Planning Board's assignments of responsibility for each project in 2003. Based on the recommendations in the Walkkill Comprehensive Traffic Impact Study and the additional measures recommended by Sells, the Summary of Projected and Planned Development Traffic Volumes and Summary of Cost Estimates for Projected and Planned Developments have been updated and are included in FEIS Appendix G .

Recommended Intersection Improvements Walkkill Comprehensive Traffic Impact Study ¹ and Recommendations of Chas. H. Sells, Inc. ⁴		
<u>Location</u>	<u>Improvement</u>	<u>Project Assignment²</u>
NYS Route 211 & Silver Lake Scotchtown Road	Signal Timing Modifications	NA
NYS Route 211 & Bert Crawford Road/Dunning Rd	Signal Timing Modifications	NA
NYS Route 211 & NYS Route 17 EB On Ramp	Signal Timing Modifications	NA
NYS Route 211 & NYS Route 17 WB On/Off Ramp	Signal Timing Modifications	NA
NYS Route 211 & Tower Drive/North Galleria Drive	Signal Timing Modifications ³ & Eastbound double left turn lane on Route 211	Fair share contributions to Current Town Project³ Fair share contributions to Future project (assignment to be determined)
Silver Lake Scotchtown Road & Bert Crawford Rd	<u>Install signal, coordinate timing with Mud Mills at SLSR</u>	Golden Triangle Phase 1⁵
Silver Lake Scotchtown Road & Mud Mills Rd	Signal Timing Modifications & <u>Realign Mud Mills approach within ROW, repave with high friction wearing course, and remove roadside obstructions</u>	Kabro Golden Triangle Phase 1⁵
Silver Lake Scotchtown Road & Tower Drive	Install Signal, <u>Construct Southbound left turn lane & Northbound right turn lane on SLSR, improve sight distance through profile modifications</u>	MKA
Mud Mills Road & Cottage Street Extension	Signalization & Grading to improve sight distance, Signalization of the Cottage Street Ext. Railroad underpass, <u>Realign Mud Mills Road, provide better sight distance to new intersection</u>	Kabro & Golden Triangle Phase 1⁵
Silver Lake Scotchtown Road & Neeley Street	Signing & Pavement Marking	NA
Silver Lake Scotchtown Road & Maltese Drive	Signing & Pavement Marking	NA
Bert Crawford Road & Maltese Drive	Signalization, coordinate with Route 211 signal, <u>Consider one-way traffic flow on Maltese Drive</u>	Walkkill Manor & Scotch Valley Subdivisions & Golden Triangle Phase 1⁵
Tower Drive & Industrial Drive	Signalization, <u>Coordinate with Town Hall improvements</u>	Tower Ridge
Wisner Avenue & Cottage Street Extension	Signing and Pavement Marking	NA

Source: John Collins Engineers 2005.

¹ These recommended improvements are attributable to the cumulative effect of background growth and all the studied projects, including development of the Golden Triangle residential Phase 1 only.

² Project assignments were identified by the Town at a joint meeting with the various project developers in Summer 2003.

³ Eastbound double left turn lane on Route 211 at the intersection has been identified as a future project. Both projects will be partially funded by contributions from the pending development projects identified in the Walkkill Comprehensive Traffic Impact Study by John Collins Engineers, including Golden Triangle Phase 1.

⁴ Additional mitigation measures recommended by Chas. H. Sells, Inc., in Table 2 of its Memo to the John F. Ward, Town Supervisor, dated September 22, 2005, are underlined.

⁵ Golden Triangle Phase 1 will, at the option of the Town, EITHER a) assist Kabro in the intersection improvements at Mud Mills Road and Cottage Street Extension; OR, b) install a traffic signal at Maltese Drive/Bert Crawford Road intersection (including coordinate timing with Bert Crawford Road/NYS Route 211 signal); OR, c) install a traffic signal at Silver Lake-Scotchtown Road/Bert Crawford Road intersection (including coordinate timing with Mud Mills Road/Silver Lake-Scotchtown Road signal) together with realign Mud Mills Road approach to Silver Lake-Scotchtown Road within the right-of-way, repave with high friction wearing course and remove roadside obstructions.

Comment 5-3 (DEIS Public Hearing, Doug Dulgarian, Wallkill Planning Board, September 15, 2004): Silverlake Scotchtown Road intersection with Tower Drive. ... On the other intersections you give us an overall intersection level of service. On that one you don't. ... At the end you say, "with signalization"; does that mean you are proposing a signal there? ... So, the "C" I am looking at the end there, that's an average? We still are going to have the two "F's" above it? ... With the light it will still be an "F"? ... And is that the same for the intersection at Tower and Industrial where we have some "F's" and E's" there? ... My question is ... the level of service on the majority of the ones we are looking at are corrected by the signalization and the mitigation?

Response 5-3: *An overall level of service relates only to signalized intersections since the movements are dependent on one another.*

As part of the regional traffic improvements, a signal is proposed at Silver Lake-Scotchtown Road and Tower Drive. As outlined in the Wallkill Comprehensive Traffic Impact Study, and described above, part of the MKA project contribution to these regional traffic improvements is to fund the cost and installation of this signal and separate turn lanes. Operating conditions at the intersection of Silver Lake-Scotchtown Road and Tower Drive, after signalization, will be a level of service C or better. Similarly, the Tower Ridge project will be funding the cost and installation of a traffic signal at the intersection of Tower Drive and Industrial Drive. Operating conditions at the intersection of Tower Drive and Industrial Drive, after signalization, will be a level of service C or better.

Upon signalization at the intersection of Tower Drive and Silverlake-Scotchtown Road, all approaches to the intersection will operate at a Level of Service "C" or better during peak periods. The Levels of Service by approach are summarized below:

Tower Drive & Silver Lake Scotchtown Road Level of Service with Signalization						
Approach Direction	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
	Level of Service	Delay (Seconds)	Level of Service	Delay (Seconds)	Level of Service	Delay (Seconds)
Eastbound	B	17.7	C	31.2	C	21.5
Westbound	B	18.3	C	31.7	B	15.8
Northbound	C	25.9	C	28.5	C	27.9
Overall	B	19.8	C	30.6	C	21.6
Source: John Collins Engineers, 2005						

Similarly, at the intersection of Tower Drive and Industrial Drive, which is slated to be signalized in association with the Tower Ridge development, the approach Levels of Service will be improved from the current conditions to "C" or better. The resulting approach Levels of Service for Build conditions will be as follows:

Tower Drive & Industrial Drive Level of Service with Signalization						
Approach Direction	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
	Level of Service	Delay (Seconds)	Level of Service	Delay (Seconds)	Level of Service	Delay (Seconds)
Eastbound	B	11.9	C	22.9	C	21
Westbound	B	18.2	C	23.5	C	22.8
Southbound	C	27.1	C	31.2	C	26.5
Overall	B	18.7	C	24.9	C	23.1
Source: John Collins Engineers, 2005						

Comment 5-4 (DEIS Public Hearing, Doug Dulgarian, Wallkill Planning Board, September 15, 2004): The emergency exit now on the road that may or may not happen, that's just going to be an emergency access for now on Phase I? ... So there is only going to be the one in and one out at this point and that's just going to be for emergency vehicles?

Response 5-4: There is one main access from the proposed Golden Triangle Phase 1 project onto Silver Lake-Scotchtown Road. A second roadway is proposed to connect Golden Triangle Phase 1 to Silver Lake-Scotchtown Road that will provide for emergency access and a secondary means of access into the residential project for safety. The major movements along Silver Lake Scotchtown Road will operate at a level of service "A", the minor movements at the site access will operate at a level of service "D" or better.

Comment 5-5 (DEIS Public Hearing, Patrick Owen, Wallkill Planning Board, September 15, 2004): [Towards the other traffic improvements on a fair share basis] ... when does the contribution go into effect, after Phase I or Phase II or a little bit after each? ... And just so we are clear, if Phase II doesn't go through, the ramp never gets built?

Response 5-5: Golden Triangle will make specific contributions to improving regional traffic in the project area as part of the Phase 1 proposal, as listed in FEIS Section 1.2. The proposed new Town Road and the interchange improvements to Exit 120 on Route 17 are part of the full build development plan for Golden Triangle, and are not part of Phase 1 of the project.

Comment 5-6 (DEIS Public Hearing, Gerald Luenzmann, Wallkill Planning Board, September 15, 2004): I think the project ... Phase I and Phase II, would alleviate a lot of traffic problems that we have right now. But no matter what happens if it's Phase I or Phase II or both, the choke-point to me is Silver Lake-Scotchtown Road. And there is nothing that I have seen that's going to mitigate the traffic and the danger that's associated with traversing getting across or driving down Silver Lake-Scotchtown Road. There is a lot of people, for example, that walk up and down, go to the stores, they go to different stores and there is no sidewalks. It's a speedway. There are houses that get rammed continuously by late night drunk drivers, and I think you have to pay attention to that.

And when you consider not only this project, but all the other projects, and I don't see Silver Lake-Scotchtown Road being improved, it's a 3 lane, 4 lane, I mean leave right off of Freezer Road and you sit there it seems like 10 minutes, you can't get across, I am talking Freezer Road.

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You take a look at all the people walking to the deli, and I think we need a lot more consideration of professionals on what to do with Silver Lake-Scotchtown Road. Tower Drive is an abomination right now. Heaven help us what's going to happen when this goes in. A light will not solve the problem. It's going to stagger the problem so you could spit and spurt through the intersection. But is there going to be a left hand turn lane on Silver Lake-Scotchtown Road? Or are you just going to sit there for a 3 minute light like you do up on 211 and Tower Drive? I mean, there has got to be more serious consideration on what the traffic flow is going to be through the whole Silver Lake Scotchtown Road corridor. There are safety issues, we need sidewalks, and we need yellow lights, we need striping. There is nothing here that's going to make me feel comfortable, unless it's all done.

***Response 5-6:** Road widening of Silver Lake-Scotchtown Road from Mud Mills Road to the northerly proposed site access road (to provide an improved pavement section and remove roadside objects), and a left turn lane on Silver Lake-Scotchtown Road into Golden Triangle is to be constructed as part of the Phase 1 residential project, as well as a new sidewalk along the Silver Lake-Scotchtown Road frontage of the project site. (All off-site traffic improvements proposed as part of Golden Triangle Phase 1 are listed in FEIS Section 1.2.) A number of improvements to the regional road network have been identified in the Walkkill Comprehensive Traffic Impact Study and projects pending in the area have been given responsibility for their implementation. Refer to Response 5-2.*

Comment 5-7 (Letter #4, Salvatore J. LaBruna, Walkkill Conservation Commission,

Undated): One of this commission's primary concerns with the "Golden Triangle" project is the effect this development will have on local traffic. The roadway and intersection upgrades proposed in the DEIS may ease existing traffic problems, but these improvements are not sufficient enough to prevent further congestion that would inevitably result from the commercial development of Phase II and other pending projects in the immediate vicinity. The members of this commission are not convinced, as some members of the planning board are, that the proposed Town Road from Silver Lake Scotchtown Road to Route 211 will improve traffic conditions in the area of this project. Furthermore, the uncertainty regarding the proposed alteration of the Exit 120 interchange on Route 17 makes it very difficult to assess the effects this project will have on local traffic patterns.

***Response 5-7:** Two traffic studies have been conducted for this project. The first one, the Walkkill Comprehensive Traffic Impact Study (DEIS Appendix G), assessed the traffic impact of nine proposed projects in the town including Golden Triangle Phase 1 residential. As discussed, traffic mitigation measures have been proposed and a plan for implementation has been identified in the Walkkill Comprehensive Traffic Impact Study. The second traffic study, the Golden Triangle Traffic Impact Study, included as Appendix H of the DEIS, specifically addresses the traffic impacts of the Phase II or full build out of Golden Triangle.*

Sixteen intersections were studied: the fourteen previously listed and the following two additional intersections:

-Silver Lake Scotchtown Road / Proposed New Town Road intersection

-Silver Lake Scotchtown Road/ Proposed Route 17 Exit 120 on and off ramps.

For each of the sixteen intersections, all major movements will operate at a level of service D or better with one exception. The Route 211/Tower Drive/North Galleria Drive

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intersection declines to a level of service E in the No-Build condition, with no further decline as a result of the full build out of Golden Triangle.

The Town has plans to upgrade this intersection through construction of a dual left turn lane on Route 211. Contributions are being made on a fair share basis by all the pending projects included in DEIS Table 3.6-3, shown earlier, including Golden Triangle. Upon completion of these improvements this intersection will operate at a level of service "D" or better.

The provision of the New Town Connector Road from Silver Lake-Scotchtown Road to Route 211 with the new ramp connections to Route 17 will improve traffic flow in the area since it will provide an alternate travel path for vehicles to access these corridors and will allow traffic from the Silver Lake-Scotchtown corridor to access Route 17 eastbound without traversing onto Route 211. For example, traffic which now uses Tower Drive south to Route 211 westbound and turns left onto Route 17 southbound or eastbound will be able to proceed on Silver Lake-Scotchtown Road to the New Connector Road and enter onto the new ramp to Route 17 eastbound directly. This will lessen some of the traffic on Route 211 including reducing turning movements and thus providing more efficient operation. Furthermore, the development of the commercial portion of the Golden Triangle project will not proceed until the Town Connector Road is completed. The full commercial development is dependent on construction of the Town Road and interchange modifications.

Comment 5-8 (Letter #4, Salvatore J. LaBruna, Walkill Conservation Commission, Undated): The proposed modifications to the Exit 120 interchange on NYS Route 17 must receive formal approval from the New York State Department of Transportation and the Federal Highway Administration (FHWA).

Response 5-8: *It is correct that the proposed modifications to the Exit 120 require approval from the New York State Department of Transportation and FHWA. A memo from the project traffic engineer relative to the status of the approval of this interchange is included in FEIS Appendix A, Correspondence. The memo indicates favorable support from the NYS DOT Region 8. Also included in Appendix A is a letter to the Town of Walkill from the NYS DOT, dated March 18, 2004, which summarizes the State's position on the ramp modification.*

The project traffic engineer is in the process of finalizing the Exit 120 Modification Study for submission to the NYS DOT for its review and approval of the improvements to the Exit 120 interchange. Upon completion of the NYS DOT review, the interchange design will be submitted to FHWA for its review and approval.

Comment 5-9 (DEIS Public Hearing, Nida Guenste, October 20, 2004): I would also like to ask that a traffic study be done because if you look at the site with a proposed entrance and exit, right now we have a lot of traffic that comes down Tower Drive, down 211, and I know we have a lot of congestion going onto the highway, but if you follow the blue line at Scotchtown Silverlake Road, and you have got a lot of development over here, these people are not going to go over to Tower Drive to come down the highway - they're going to come down Scotchtown Silverlake Road, I would think. I don't know, I am not a traffic expert, but I think this is something that should be addressed.

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Response 5-9: As stated earlier, two traffic studies have been conducted for this project, the first one, the Walkkill Comprehensive Traffic Impact Study, included as DEIS Appendix G, assessed the traffic impact of nine proposed projects in the town including Golden Triangle Phase 1 residential. As discussed, traffic mitigation measures have been proposed and a plan for implementation has been identified in the Walkkill Comprehensive Traffic Impact Study. The second traffic study, the Golden Triangle Traffic Impact Study, included as Appendix H of the DEIS, specifically addresses the traffic impacts of the Phase II or full build out of Golden Triangle.

The intersection of Silver Lake-Scotchtown Road and Route 211 is currently signalized. As part of the regional traffic improvements, signal timing modifications have been proposed. Upon completion of the signal timing modifications, after completion of Golden Triangle Phase 1 is built, the operating conditions will be a level of service C or better.

Comment 5-10 (DEIS Public Hearing, Salvatore LaBruna, October 20, 2004): On the traffic issue, I know that the proposed Town road, if it was just a residential development, I feel maybe it could have a beneficial impact. But I think with any, you know, benefit it would have would be needed by the commercial development that would come in, especially if the interstate exit comes right through this Phase II development. With a hotel and restaurant, there would be far more traffic pulling off the road. Holiday traffic would be a problem if there is major retail centers there.

Response 5-10: The Golden Triangle Traffic Impact Study evaluated traffic to be generated by the various components of the full build out scenario. Trip generation was calculated according to the latest Institute of Traffic Engineers Trip Generation methodologies which are based upon specific land use categories. Trip distribution for the full build out scenario is included in the Golden Triangle Traffic Impact Study as Figures 19, 20, and 21 and is based upon regional traffic patterns.

With the completion of the mitigation measures identified in the Golden Triangle Traffic Impact Study, including construction of a proposed new Town Road which will connect the Silver Lake Scotchtown Road and NYS Route 211 corridors, the Golden Triangle development will not significantly impact the roadway system in the vicinity of the site. The construction of this new town road will improve traffic conditions along Silver Lake Scotchtown Road, Bert Crawford Road, Tower Drive and NYS Route 211 within the study area and will also allow the implementation of the Exit 120 ramp modifications to eastbound NYS Route 17.

Comment 5-11 (Letter #7, Salvatore J. LaBruna, Walkkill Conservation Commission, May 2, 2005): The data used in the traffic study for this project was obtained during the months of January, March and April of 2003. We believe it is reasonable to assume that there is significantly less traffic on the road during the winter months, compared with traffic levels typical of the summer and holiday seasons. Consequently, we are concerned that this traffic study may not represent an accurate prediction of future traffic conditions. The applicant should consult the NYS DOT publication entitled *Guidelines for Preparing Traffic Impact Studies*, and any other relevant documents to consider the implications of gathering traffic data during certain months of the year. Additionally or alternatively, the Planning Board may wish to briefly consult with a Traffic Engineer to discuss how the timing of data collection might affect the accuracy of the traffic study.

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Response 5-11: *The Town has engaged Chas. H. Sells, Inc., engineers to perform an independent review the Walkkill Comprehensive Traffic Impact Study, which assessed the cumulative effects associated with nine development projects in the Walkkill area including the Phase 1 residential portion of the Golden Triangle proposal. In particular, the Sells review included an analysis of roadway safety and evaluation of the ability of the roadway segments connecting the study intersections to safely accommodate increased volumes of traffic. As concluded in its September 22, 2005, memo to the Town,² Sells states that the improvements proposed as part of the Walkkill Comprehensive Traffic Impact Study taken together with the additional recommendations of Sells will provide the Town with a roadway network that will operate at acceptable levels of service, while also addressing the contributing factors to the high accident locations that may be exacerbated by the increased demand from the projects currently in front of the Planning Board. A summary of the Sells review of the Walkkill Comprehensive Traffic Impact Study is included in FEIS Appendix F.*

² Chas. H. Sells, Inc., Memo to John F. Ward, Town Supervisor, dated September 22, 2005. (See FEIS Appendix G)

6.0 COMMUNITY SERVICES COMMENTS AND RESPONSES

To clarify the financial impact that the proposed Golden Triangle project will likely have on the Middletown Enlarged City School District, a fiscal analysis worksheet that pertains exclusively to the Phase I residential portion of the project has been prepared. This analysis uses current tax rates to update the DEIS fiscal analysis and incorporates input from the Town of Walkill Tax Assessor.

The tax rates in the analysis have been updated to reflect current 2006 rates, with school district tax rates for the current 2005/2006 school year.¹ The Assessor also supplied the following tax assessments for townhouse projects similar to Golden Triangle in the Town of Walkill.

Comparable Assessments Town of Walkill				
Project Name	Number of Bedrooms	Year Built	Assessed Value	2006 Taxes*
Water's Edge	2BR	1992	\$21,200	\$2,629
Water's Edge	3BR	1992	\$25,200	\$2,629
Hillside Village	2BR	1996	\$24,200	\$3,000
Lake Ridge Estates	2BR	2002	\$29,500	\$3,658
Lake Ridge Estates	3BR	2002	\$34,100	\$4,228
Projected Taxes				
Golden Triangle	2BR	2006	\$32,300	\$4,005
Golden Triangle	3BR	2006	\$38,300	\$4,749
* Includes County, Town and School Taxes				

The Fiscal Analysis Worksheet included below, uses projected annual rental income values to arrive at assessed values for the proposed project. The assessed value of the units at Golden Triangle are expected to range from approximately \$32,350 to \$38,360, with an average property tax of approximately \$4,583. These values are consistent with the range of assessed values and taxes for similar projects in the Town of Walkill taking into account the age of the other projects.

The Business Office of the Middletown Enlarged City School District² provided the following information regarding the school budget and District enrollment:

- Total 2005/2006 school budget is \$ 99,060,624.
- School District 2005/2006 revenue to be raised by property taxes is \$46,247,235, excluding STAR exemptions.
- Total District Enrollment as of October 2005 is 7070 students.

Based upon the above information, the estimate of per student cost to the school district which will be raised by property tax is \$6,541 per student.³ Using the projected range of 23 and 42 new students that may reside in the residential portion of the Golden Triangle project (further discussed in Response 6-3), the cost to the school district is expected to range from \$150,443 to \$274,722. Using the Income Approach of calculating tax revenue generated as shown in the

¹ Phone conversations with Town of Walkill Tax Assessor Molvina Wanat, on January 17, 2006.

² Phone conversation with Jill Fiumano, School Business Assistant, on January 6, 2006, confirmed with Elizabeth McKean, School Business Administrator on January 18, 2006.

³ Confirmed in cost per student tabulation received from Edwin Estrada, Board of Education, January 31, 2006. (Refer to FEIS Appendix A.)

Fiscal Analysis Worksheet below, annual property tax revenue to the Middletown Enlarged City School District, from the residential portion of the Golden Triangle project is projected to be \$284,405. Comparing this revenue to the projected costs of 23 to 42 students, the estimated revenue to the school district is projected to exceed costs to the district by between \$9,683 and \$133,962 per year. This calculation is shown below.

Projected Revenue & Cost to Middletown City SD - GT Residential	
Income Value	\$3,529,033
x Current Tax Rate per \$1000 AV	80.5900
= Annual Tax Revenue	\$284,405
Per Child Cost to SD	\$6,541
x Number of Children @ 0.2552/unit	23
= Cost to SD for 23 children	\$150,443
Projected Taxes	\$284,405
- Projected Cost to SD for 23 children	(\$150,443)
= Net Surplus to SD - High	\$133,962
Per Child Cost to SD	\$6,541
x Number of Children @ 0.4700/unit	42
= Cost to SD for 42 children	\$274,722
Projected Taxes	\$284,405
- Projected Cost to SD for 42 children	(\$274,722)
= Net Surplus to SD - Low	\$9,683

FISCAL ANALYSIS WORKSHEET -- GOLDEN TRIANGLE Phase 1 Residential - Town of Walkill
EXISTING & FUTURE CONDITIONS - Income Approach 2006 TAX RATES

Taxing Jurisdiction	Current Res. I Assess.	Rate*	Current Taxes*	Projected Taxes	Difference
Orange County	\$186,000	\$14.2352	\$2,648	\$50,236	\$47,589
Town of Walkill Highway	\$186,000	\$5.7618	\$1,072	\$20,334	\$19,262
Washington Hgts. Fire #	\$186,000	\$7.9062	\$1,471	\$27,901	\$26,431
Silver Lake Fire	\$186,000	\$4.0554	\$754	\$2,719	\$1,965
Washington Hgts Fire	\$186,000	\$5.0721	\$943	\$9,666	\$8,722
Thral Library	\$186,000	\$4.0644	\$756	\$3,873	\$3,117
Walkill Water 1***	\$186,000	\$2.7570	\$513	\$9,730	\$9,217
Walkill Sewer ***	\$186,000	\$20/ac. or unit	\$1,863	\$1,800	(\$63)
		\$20/ac. or unit	\$1,863	\$1,800	(\$63)
Middletown Central Schools	\$186,000	\$80.5900	\$14,990	\$284,405	\$269,415
Sub-total Property Taxes			\$26,872	\$412,463	\$385,591
Sub-total Fees				\$0	\$0
TOTAL TAXES/FEES			\$26,872	\$412,463	\$385,591
Taxes to Town			\$9,235	\$77,822	\$68,588
Average Taxes per unit				\$4,583	

Projected Total Income Value - CT Residential

Projected AV Residential = \$3,529,033
 Projected AV Non-Residential = \$0
 Total Projected AV = \$3,529,033

Total Residential Units = 90
 Number of 2BR Townhouse units = 22
 2BR Annual Rental Value @ \$1,195 per unit per month = \$315,480
 Sub-total = \$315,480
 Number of 3BR Townhouse units = 68
 3BR Annual Rental Value @ \$1,350 per unit per month = \$1,101,600
 Sub-total = \$1,101,600

Total Projected Annual Income = \$1,417,080
 Vacancies (at 5%) = (\$70,854)
 Gross Income = \$1,346,226

Operating Annual cost @ \$7900/unit per year = (\$711,000)
 Net Revenue = \$635,226
 Capitalization Rate = 18.0%
 Income Value = **\$3,529,033**

2BR unit Projected Assessed Value = \$32,350

3BR unit Projected Assessed Value = \$38,361

Comment 6-1 (Letter #1, Jeff Jaques, Silver Lake Fire District, Undated): After further review of the proposed Golden Triangle Project it has become apparent that this project will greatly impact the Silver Lake Fire Department. Some facts that I would like to discuss are the fact that our department is 100 Percent volunteer, we currently operate out of an outdated fire house in which we have outgrown; we also currently operate a 1990 Ladder which is due for replacement.

Our department currently operates with approximately 35 active volunteer firefighters. In the 1980's our department operated with 50 active volunteers. Every year this number has dwindled at an alarming rate. In the current EIS report it is stated that "based on published standards, approximately 2.3 firefighters would be needed." If the Fire District were to hire 2 paid firefighters it would cost the District approximately \$140,000 per year.

Our present firehouse was built in 1964, the current size of this house will not outfit newly designed ladder trucks due to changes in the NFPA 1901 standards for safety and enhancement features. Also due (to) a heavier amount of required reports and files our current office space has also become extremely too small for our department's needs. Our district is presently researching the possibilities of building a new firehouse which has an estimated cost of \$6 million. Our current working budget is \$500,000 per year. This project is expected to be 100 percent bonded.

Our department currently operates two engines, one ladder truck, one heavy rescue truck, and two utility vehicles. Our 1990 ladder is due for replacement. A new ladder truck would cost approximately \$700,000 to \$900,000.

In closing, the current EIS report states that "tax revenue generated by the proposed developments would offset costs associated with the cumulative development." I feel that the facts stated above clearly show that in order for your development to be protected to the highest standard our department must make some costly changes.

***Response 6-1:** The needs of the Silver Lake Fire District are based upon current conditions. The new firehouse and replacement of the 1990 ladder vehicle are needs which are anticipated by the Silver Lake Fire District, irrespective of the Golden Triangle project.*

The DEIS analysis shows that construction of Golden Triangle is anticipated to generate tax revenue to the Silver Lake Fire district which would total \$28,639, an annual increase of \$28,348 in revenue.

The net revenues to the Fire District could support a debt service for capital improvements which could be used to improve the district's facilities. At a 4 percent interest rate, amortized over a period of 30 years, a net revenue of approximately \$28,700 could support up to \$2,000,000 of capital construction.

Comment 6-2 (DEIS Public Hearing, Ed Estrada, September 15, 2004): [I suggest] that the Planning Board really take a look, not just at this plan as one individual plan being recommended, but as a whole, to try to figure out what impact the Tower Ridge development, which is in excess of 150 units, will have on the infrastructure of that particular area, the fire district, the police department, and the city school district.

Response 6-2: *Cumulative impacts to the Middletown City School District and the Fire Districts are discussed in the DEIS section 3.8, Community Services. A listing of proposed projects is shown in Tables 3.8-2 and 3.8-3 for the school district and fire districts respectively. Each of these projects has been evaluated individually for potential environmental impacts. Similar to Golden Triangle, each of the proposed projects will generate tax revenue to the various community service districts which will likely mitigate increases to the various service districts.*

Comment 6-3 (DEIS Public Hearing, Doug Dulgarian, Wallkill Planning Board, September 15, 2004):

In this DEIS on page 3.8-2 they talk about the 90 units, and I just want your professional opinion on this, or maybe you could check it out. It says, "The proposed project will increase the need for school services, including bus transportation for the additional 23 school aged children expected to attend public schools." Now, they base that on a development impact assessment handbook that was published by the Urban Land Institute in 1994 which states that, "This type of development will have 0.2552 school aged children per unit." That doesn't sound right to me.

Response 6-3: *The demographic multiplier used in the DEIS to project school children was 0.2552 students per unit. This is an average rate for the Northeast region published in the Urban Land Institute's Development Impact Assessment Handbook⁴ for mixed 2- and 3-bedroom townhouse type developments. The ULI publication is typically relied upon by professional planners for studies such as this. Using this multiplier, a total of 25 school-age children would be expected from the Golden Triangle development. Of this number, 23 could be expected to go to school in the Middletown City School District.*

Substantiation of school enrollment statistics comparable to the multiplier used in the DEIS is presented in information presented to the Town of Wallkill Planning Board from Garling Associates, professional planning consultants, dated June 21, 2005, and is included in FEIS Appendix F.

The Planning Board requested an alternative assessment using a multiplier based on the Canterbury Knolls⁵ development in the Town of Wallkill. Canterbury Knolls has 185 units. According to Mid-City Transit, the transportation office for the Enlarged City School District of Middletown, 87 public school students were picked up at Canterbury Knolls in 2005. For a development of 185 units with 87 school children, there are 0.470 school children per unit, on average. Using the multiplier derived for Canterbury Knolls as a worst case, the number of school age children that would be expected to reside at the residential portion of the Golden Triangle project is 42 children (90 x 0.470).

Using the ULI multiplier and Canterbury Knolls multiplier to establish a range, between 23 and 42 students would reside at the residential portion of the Golden Triangle project.

Comment 6-4 (Letter #6, Edwin A. Estrada October 20 2004): It is estimated that the Golden Triangle project would yield an estimated 30-75 new students to our school district. Although, by itself, this project appears to have only minimal impact, projected development from all of the Town of Wallkill housing projects that reside within the Middletown School District would have significant impact on our infrastructure and educational programs.

⁴ Burchell, Listoken, et.al. *Development Impact Assessment Handbook*. Washington, DC: The Urban Land Institute, 1994.

⁵ Canterbury Knolls was initially identified as a condominium development, having unit sizes typical of townhouses and a homeowners association, although it is actually a small lot single family residential development.

Our example of a project causing us concern is the impact on our district from the Tower Ridge apartment complex. With one hundred and ninety-eight apartments and depending on who you go to for student estimates, we understand that student enrollment from this project alone, could be from 100 to 250 students. More analysis is necessary to arrive at a more dependable number and then to plan the appropriate response by the school district to that growth potential.

The Enlarged City School District of Middletown is, for all practical purposes, surrounded by the effects of the Town of Wallkill's growth and development. Our high school is currently severely overcrowded and we have a capital improvement program that will expand the building to a rated capacity of 2700 students. When the new wing opens up in 2007 we anticipate a student enrollment of 2200. Our middle and elementary schools are also approaching their rated capacity.

Response 6-4: *As stated above, the proposed project will increase the need for school services including bus transportation for an additional 23-42 school age children expected to attend public schools in the Middletown City School District. This range represents approximately 0.8 to 1.3 percent of the total number of students enrolled in the three affected schools, grades K-12. This impact assumes that all of the townhouses at the proposed Golden Triangle development were to be built and occupied at one time. It is not expected that all of the proposed residences will be constructed and occupied at the same time. It is likely that the projected student population from the proposed residences will be introduced into the district over a multi-year period. It is also likely that the school age students in the project would be at various grade levels, thus would attend all three schools nearest the project site. The introduction of students over a multi-year period, and distributed to several schools would ameliorate the effect of the increase in school district enrollments associated with the project. The approval and build-out process of the applicant's project provides time to allow the Middletown City School District to plan for and implement measures to accommodate the new students.*

Based on the information presented at the beginning of this section (the school budget, District enrollment, cost per student, the projected range of 23 and 42 new students that may reside in the residential portion of the Golden Triangle project, and the current school tax rate), the cost to the school district is expected to range from \$150,443 to \$274,722. Using the Income Approach of calculating tax revenue generated, annual property tax revenue from the residential portion of the Golden Triangle project is projected to be \$284,405. Comparing this revenue to the projected costs of 23-42 students, the estimated revenue to the school district is projected to exceed costs to the district by between \$9,683 and \$133,962 per year.

The additional revenue to the school district resulting from property taxes from the developed project would be available to offset the small potential increase in demand for educational services resulting from Phase 1 of this project.

Comment 6-5 (DEIS Public Hearing, Edwin A. Estrada, October 20, 2004): The Middletown High School right now has a functional capacity when it was built for 1300 students. The rated capacity is 1800 students. As I speak to you this evening there are 2100 students in the high school.

The improvements that we have scheduled for the high school which, again, will not take effect until the school opening of 2007, means that we will have a gap of approximately 3 years before we actually get to the rated capacity of 2700 students.

So, all of the developments that are in front of the Planning Board will obviously have a severe impact on how the school district has to restructure its students at that particular time.

Next year, beginning in September, the school district will also be instituting full day kindergarten, which obviously means that double the amount of kids that normally would be split between morning and afternoon kindergarten sessions will now be included all day in each of the elementary schools.

Response 6-5: *Plans for expansion of school district facilities are already in progress. As described in Response 6-4, the estimated annual revenue to the school district from Phase 1 of the proposed Golden Triangle project is projected to exceed costs to the district of between \$9,683 and \$133,962 per year. As outlined earlier, the additional student population is expected to be distributed over several schools and dispersed over several years. The earliest the school district could be impacted is September 2006.*

Comment 6-6 (Doug Dulgarian, Comments from May 4, 2005, Planning Board Meeting): A letter addressed to the Planning Board from the Enlarged City School District Superintendent dated April 19, 2000, was referenced with regard to student multipliers. The following is excerpted from that letter (a full copy is included in FEIS Appendix A): Using current data that indicates there are approximately 12,386 residential units in the school district (including TOW), and we have approximately 6,314 students, one can presume 1.96 school-aged children per unit.

Response 6-6: *Using the numbers of residential units and students cited above, a multiplier of 1.96 represents the ratio of housing units per student, not the ratio of students per household. The ratio of students per household is 6,314/12,386 or 0.51 students per unit on average. Such a multiplier represents all of the housing units in the school district without regard to housing type. However, demographic studies show that the total number of people living in a housing unit, as well as the number of school-aged children in a housing unit, is a function of the housing type. A single family residence typically has a larger household size and number of children in the family than townhouse/condominium style housing, which in turn typically has a larger household size and number of children than an apartment. The number of occupants also reflects the number of bedrooms in a unit, with 3- and 4-bedroom units typically having significantly more children than 1- and 2-bedroom units. There are many other factors that also affect household size. As is evident from the numbers above, at least half of all residential units in the district have no school-aged children at all.*

With housing in the school district being predominately single family housing, and using the numbers cited above, single family units would have greater than 0.51 students per household while condominiums (like the Covered Bridge at Golden Triangle project) and apartments would have less than 0.51 students per household, on average. Published multipliers such as those developed by Robert W. Burchell, David Listokin, and William R. Dolphin of Rutgers University's Center for Urban Policy Research bear out these characteristics, as do less formal surveys of existing housing developments in the region. Surveys of school-age child populations for existing projects in the region are included in FEIS Appendix F. Response 6-7 elaborates on this information.

Comment 6-7 (Letter #7, Salvatore J. LaBruna, Walkill Conservation Commission, May 2, 2005): A number of local officials have questioned the estimated number of school-age children that the proposed residential portion of the project would add to the Middletown City School District. The project sponsor has utilized a demographic multiplier for this type of land use that was developed by the Urban Land Institute. According to the ULI Web site, the membership of this organization consists of "leading property owners, investors, advisers, developers, lawyers, lenders, planners, regulators, contractors, engineers, university professors, librarians, students and interns." This description does not indicate that it is a balanced, unbiased source for obtaining critical data. In Response 6-3 of the FEIS, the applicant has appropriately sought to compare their estimate to the actual numbers of students that similar projects have yielded to assuage the concerns of town and school officials. However, none of the developments listed for comparison are in the Town of Walkill. Furthermore, they are all located in municipalities that are along or very near the New York State Thruway, a difference that might produce a substantial variation in the demographic and social characteristics of these types of developments.

In regard to the effect on schools, the applicant should attempt to locate similar projects within the Town of Walkill and provide the actual numbers of school-age children currently living in those developments. They should consider finding an alternative method of calculating the number of potential students.

Response 6-7: *The demographic multipliers published in the Urban Land Institute's Development Impact Assessment Handbook are based upon data from the American Housing Survey (AHS) conducted by the Bureau of the Census for the U.S. Department of Housing and Urban Development. The AHS data are compiled and analyzed by the most noted practitioners of fiscal impact analysis in the United States -- Robert W. Burchell, David Listokin, and William R. Dolphin of Rutgers University's Center for Urban Policy Research. The Handbook is considered the "planning standard" for impact assessment methodology and multipliers.*

The Development Impact Assessment Handbook states that "Housing unit size continues to be the dominant criteria affecting both household size and number of school age children." The population multipliers in this publication were derived from extensive independent research of population trends based on actual US Census information, including as relates to housing type. The Development Impact Assessment Handbook, published in 1994, is the latest, most comprehensive published source of demographic multipliers distinguished by housing type. Although the raw data is collected biannually, analysis of demographic trends and recalculation of the multiplier formulas is a complex process. According to Rutgers University Center for Urban Policy Research, Dr. Robert Burchell and David Listokin are in the process of preparing an updated version of the handbook based upon 2000 Census data.

Notwithstanding the published data compiled by Rutgers' expert demographers, four residential projects were identified by the Tax Assessor of the Town of Walkill as being townhouse or condominium multifamily projects located within the Town. Information was obtained from the transportation offices of the Middletown School District and the Goshen School District as to the number of students that are actually picked up from each of the four residential developments. The following table identifies the range of school-age children per unit (demographic multiplier) specific to the townhouse and condominium multifamily projects in the Town of Walkill.

School Age Child Population Living in Townhouse or Condominium Projects in the Town of Walkill				
Project Name	Location	Number of Units	Number of Students	Demographic Multiplier
Waters Edge	Kensington Way	94	8	0.09
Canterbury Knolls*	Shutt Road	185	87	0.47
Lake Ridge Estates	Bert Crawford Road	31	5	0.16
Hillside Village	Hillside Drive	120	49	0.41
<i>Cumulative</i>		<i>430</i>	<i>149</i>	<i>0.35</i>
Source: Town of Walkill Tax Assessor, 2005 Enlarged City School District of Middletown, Mid City Transit Office, 2005 Goshen Central School District, Transportation Office, 2005 *Canterbury Knolls was initially identified as a condominium development, having unit sizes typical of townhouses and a homeowners association, although it is actually a small lot single family residential development.				

Using the ULI multiplier (0.2552 students per unit) and Canterbury Knolls multiplier (0.470 students per unit) to establish a range for projected school age population, between 23 and 42 students would reside at the residential portion of the Golden Triangle project.

For comparison, surveys of school-age child populations for other existing projects in the region are included in FEIS Appendix F. These surveys were presented in documentation submitted for the following projects in Orange County: The Fairways, Town of Walkill; Brighton Green, Town of Newburgh; and Orchard Hills, Town of Newburgh. The surveys represent actual counts of students living in multifamily projects constructed in the region. The range of multipliers revealed in these surveys is consistent with the range of the Town of Walkill projects. Additionally, a letter from Edwin Garling of Garling Associates in Goshen, respected planning consultant to many communities in the area, pertains to the regional trend in school-age populations found in these housing types and substantiates student multipliers of up to 0.35 students per townhouse unit. This letter is included in Appendix F.

As a worst case, a total of 42 students distributed over 12 grades represents three to four students per grade and, therefore, this project alone would not require new classrooms or new teachers. Based on the calculation provided in Response 6-4, the estimated annual revenue to the school district from Golden Triangle Phase 1 is projected to exceed costs to the district by between \$9,683 and \$133,962 per year. (See Response 6-4.)

7.0 SITE PLAN COMMENTS AND RESPONSES

Letter #5 from Richard D. McGoey, PE, dated October 12, 2004 primarily provides site plan review comments on the Phase 1 plans. Responses to these comments are as follows:

Comment 7-1 (Letter #5, Richard D. McGoey, PE, October 12, 2004): The public hearing for this project was opened on the 15th of September 2004 and left open.

Response 7-1: The Public Hearing on the DEIS for the Golden Triangle project was continued at the October 20, 2004 Planning Board meeting and then closed during that meeting.

Comment 7-2 (Letter #5, Richard D. McGoey, PE, October 12, 2004): The Fire Department has raised concerns with respect to manpower equipment and the need for a new firehouse which should be addressed in the DEIS and FEIS.

Response 7-2: As stated in the FEIS Community Service Response 6-1, pertaining to needs of the Sliver Lake Fire Department, construction of the Golden Triangle project is anticipated to generate tax revenue to the Silver Lake Fire district which would total \$28,639, an annual increase of \$28,348 in revenue. This revenue could be used for the construction of new fire department facilities.

Comment 7-3 (Letter #5, Richard D. McGoey, PE, October 12, 2004): During our work session of 20 September we requested that the stormwater management engineering report and plans be submitted in accordance with the latest requirements of NYS DEC to include water quality treatment which does not presently appear on the site plan.

Response 7-3: A revised Stormwater Pollution Prevention Plan has been prepared by Lanc & Tully Engineers in accordance with the latest requirements of New York State Department of Environmental Conservation and includes water quality treatment, as requested. The Stormwater Pollution Prevention Plan is included as Appendix E of this FEIS. The Erosion Control Plans have been included as drawing numbers 9 and 10 of 13 of the site plan drawings included at the end of this FEIS.

Comment 7-4 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Stormwater management details should be provided with the plans.

Response 7-4: Stormwater management structure details have been designed by Lanc & Tully, project engineers, and are provided on Drawing Number 10, Erosion Control Details, of the site plans included at the end of this document.

Comment 7-5 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Status of the Army Corps approvals of the wetlands and wetland mitigation areas is to be provided.

Response 7-5: In its July 15, 2005 letter, ACOE accepts the applicant's wetland boundary location map and acknowledges that the proposed activities of Phase 1 can be accomplished under NWP #39 without further authorization from ACOE, based on the project wetland impact and mitigation plans submitted and the conditions of the General Permit. Special conditions also apply that require annual reporting to ACOE for five years following installation of the Wetland Mitigation Plan.

Comment 7-6 (Letter #5, Richard D. McGoey, PE, October 12, 2004): The Board should be aware that the comments from the Army Corp has resulted in a change of the site plan, Road B and Road C, to avoid the need to cover the stream.

Response 7-6: As a result of a meeting of Mr. Robert Torgersen, LA, CPESC, with the U.S. Army Corps of Engineers, Roads B and C have been slightly relocated on the site plan to minimize the disturbance to the stream. Details are provided on the Wetland Mitigation Plan included as Drawing Numbers 11-13 at the rear of this document.

Comment 7-7 (Letter #5, Richard D. McGoey, PE, October 12, 2004): We recommended that handicap parking spaces be provided in the visitor parking areas.

Response 7-7: An additional 3 handicapped parking spaces have been provided in the visitor parking areas for a total of 4 handicapped parking spaces.

Comment 7-8 (Letter #5, Richard D. McGoey, PE, October 12, 2004): We previously recommended that the landscape plan be reviewed by a third party landscape architect. This should be discussed. The landscape plan is incomplete. A schedule should be shown specifically identifying the type and species of tree as well as caliper and/or size of the planting. Planting details should also be provided.

Response 7-8: A completed Site Landscape Plan has been prepared by Robert Torgersen LA and is included as Drawing Numbers 7 and 8 of the site plan included at the end of this document. The Site Landscaping Plan includes a schedule showing specifically identified types of tree species as well as the caliber and/or size of planting. Plantings details have also been provided.

Comment 7-9 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Water system details should include a note that locking glands will be provided on all mechanical joint fittings.

Response 7-9: Note 1 on Site Plan Sheet 5 of 13 has been provided which states that "Retainer glands are required on all fittings in addition to tie rods and thrust blocks." In addition, our office will add to this note that "Lock glands will be provided on all mechanical joint fittings."

Comment 7-10 (Letter #5, Richard D. McGoey, PE, October 12, 2004): The manufacture and type of fire hydrant is to be specified, other than just a note " to meet fire department regulations.

Response 7-10: The manufacturer and type of fire hydrant has been specified on the Hydrant Detail shown on Detail Sheet -1, included as Site Plan Sheet 5 of 13 at the rear of this FEIS.

Comment 7-11 (Letter #5, Richard D. McGoey, PE, October 12, 2004): All fire department comments should be addressed.

Response 7-11: Fire department comments received at the September 15, 2004 Planning Board meeting have been addressed in Chapter 6 of this FEIS, Community Service Response 6-1.

Comment 7-12 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Substantially more detail is required to continue including, not limited to the covered bridge details, box culvert details, striping and signage, geometric details for the roadway. Details of construction of the emergency access road, sidewalk and curb details.

***Response 7-12:** Additional details have been provided by the project engineers for the box culvert, road construction details for the secondary access road, sidewalk, curbing, striping, signage and all other necessary details, and are included as part of the site plan and shown on Drawing Numbers 5 and 6 of 13. The design for the widening of Silver Lake Scotchtown Road is being provided by John Collins Engineers.*

Comment 7-13 (Letter #5, Richard D. McGoey, PE, October 12, 2004): We would recommend that a three foot grass strip be provided between the curb and sidewalk where practical

***Response 7-13:** The Site Plan has been revised by the project engineers to incorporate a 3-foot grass strip between the curb and sidewalk within the project site.*

Comment 7-14 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Details of the cabana and pool area inside the building limits are to be shown including fencing, paving, lighting, etc.

***Response 7-14:** Details of the pool area including fencing, paving and lighting have been included in the site plan drawings. Details of the cabana will be provided by the project architect prior to site plan approval.*

Comment 7-15 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Fire hydrants have not been shown or are otherwise unclear.

***Response 7-15:** Locations of proposed fire hydrants are shown on the Grading and Utility Plan included as Sheet 2 of 13 at the end of this FEIS.*

Comment 7-16 (Letter #5, Richard D. McGoey, PE, October 12, 2004): We understand that the water main along Silver Lake Scotchtown Road are to be installed as part of another project. We should discuss how water will be made available to the Golden Triangle Phase 1 project if the other project is not successful in completing the water main in a timely fashion.

***Response 7-16:** Should the water system connection for the first part of the project to the Tower Drive system not be available in a timely fashion, a connection with a booster station for fire protection is proposed to the existing water supply line known as the Overhill Road Tank System.*

Comment 7-17 (Letter #5, Richard D. McGoey, PE, October 12, 2004): End section and rip rap should be provided at the discharge of storm drains into detention basins and water quality basins.

***Response 7-17:** End sections and rip rap are now shown on the Site Plan where storm drains discharge into detention basins and water quality basins.*

Comment 7-18 (Letter #5, Richard D. McGoey, PE, October 12, 2004): We would recommend that the floor plan of the various units be provided for a determination of the number of habitable rooms and how same may impact the parking.

***Response 7-18:** Floor plans for the various proposed units will be provided by Pendergast & Terach Architects to clarify the number of habitable rooms and the impact on parking.*

Comment 7-19 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Note 5 on sheet 2 is confusing with respect to density. Density is based upon the number of bedrooms.

***Response 7-19:** Note 5 on Sheet 2 has been clarified with respect to density, and states that density is 5 dwelling units per acre.*

Comment 7-20 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Appropriate notes should be provided which indicate that the cabana and pool area will be constructed prior to the issuance of any Certificates of Occupancy.

***Response 7-20:** Note 10 has been included on Sheet 1 of the site plan drawings which states, "The cabana and pool will be constructed prior to the issuance of any Certificate of Occupancy."*

Comment 7-21 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Note 10 on sheet 1 should indicate that the proof roll shall be found to be unyielding.

***Response 7-21:** Note 10 on Sheet 1 of the Site Plan has been renumbered to Note 11. The text has been revised to state "The sub-grade of the roadway will be proof rolled in the presence of the Town Engineer and found to be unyielding and acceptable prior to the placement of sub-base and paving."*

Comment 7-22 (Letter #5, Richard D. McGoey, PE, October 12, 2004): Our office will continue our review as additional details are provided.

***Response 7-22:** Comment noted.*

Comment 7-23 (Comment from Planning Board Workshop, July 11, 2004): The Board members were concerned about children standing on Silver Lake Scotchtown Road waiting for the school bus. The applicant should contact the School District to determine if a turn-around can be provided on the project site.

***Response 7-23:** A meeting was held on August 30, 2005 with representatives of Middletown City School District, Mid-City Transit Corp. (the school bus company), the Town Planning Board, and the applicant to discuss a potential school bus stop location within the project. At that meeting the District indicated it could not enter the project site (reiterating its May 2, 2005, response), however, a bus stop location was selected on the north side of the project entrance that would allow a shelter for children to be located off of the Town roadway. Refer to the District letter and a summary memo of that meeting in FEIS Appendix A.*

Appendix A
Correspondence



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
4 BURNETT BOULEVARD
POUGHKEEPSIE, N.Y. 12603

ROBERT A. DENNISON III, P.E.
REGIONAL DIRECTOR

JOSEPH H. BOARDMAN
COMMISSIONER

March 18, 2004

Mr. Gary Lake, Chairman
Town of Wallkill Planning Board
Wallkill Town Hall - Route 211
Middletown, NY 10940

RE: ROUTE 17 EXIT 120
INTERCHANGE MODIFICATION
TOWN OF WALLKILL

Dear Mr. Lake:

This is to advise you of the status of the proposed interchange modifications at Exit 120 of Route 17.

The concept presented to the Department for modifications to Exit 120 calls for the construction of a new town road connecting Silverlake-Scotchtown Road with Route 211 and modifications to the entrance and exit ramps to/from Route 17. The Department has completed an initial review and finds that the proposed modifications have benefit and subject to design review would be approved by the Department. As Route 17 is on the National Highway System and is also a future interstate route interchange modifications require the approval of the Federal Highway Administration (FHWA). We have discussed the proposed modifications with the FHWA and their preliminary reaction is also favorable. An interchange modification request will be prepared and submitted to the FHWA to obtain formal approval.

The consultant engineering firm of John Collins Engineers, P.C. is in the process of preparing the interchange modification request. The request once acceptable to the Department would be submitted by the Department to the FHWA for approval. The Department and Collins Engineers are coordinating the traffic projections for our Route 17 Exit 122 project and this Exit 120 project.

Please contact me at (845) 431-5723 if you have any questions.

Very truly yours,

A handwritten signature in black ink, appearing to read "Richard A. Peters".

Richard A. Peters
Regional Planning & Program Manager

cc: Phillip Greeley, John Collins Engineers, P.C.
B. Doherty, Design, Region 8

Memorandum:

To: Frederick P. Wells, Project Manager

From: Ann Cutignola, Transportation Planner

Date: August 31, 2005

Subject: Golden Triangle Project
Town of Wallkill, Orange County NY.

In response to the Town of Wallkill Planning Board's desire to route school buses through the interior of the Golden Triangle project, I set up a meeting with Elizabeth McKean, School Business Administrator for the Enlarged City School District of Middletown.

A meeting was held on August 30, 2005 at the offices of Elizabeth McKean to discuss the safe pick up and drop off of students anticipated to reside in the Golden Triangle project upon completion. The following persons were in attendance:

Elizabeth McKean - Enlarged City School District of Middletown.

Stuart Millar - Mid-City Transit Corporation.

Doug Dulgarian - Town of Wallkill Planning Board

2 other members of the Wallkill Planning Board

Lorraine Potter - Lanc & Tully Engineers

Ann Cutignola - Tim Miller Associates

Ms. McKean reiterated the school district's position that school buses cannot travel on private roads (refer to the School district's letter dated May 2, 2005). However, the district was interested in providing the safest bus stop location. Stuart Millar of the Mid City Transit Corp requested the bus stop be located on Silver Lake Scotchtown Road, on the north side of the main entrance to Covered Bridge at Golden Triangle, to allow a sufficient distance from the intersection of Mud Mills Road and Silver Lake Scotchtown Road. At this location, parent parking would be available internal to the project along Road A, adjacent to the proposed sidewalk. The Covered Bridge proposed over the sidewalk near the main entrance would provide a degree of shelter for students waiting for the school bus.

After due consideration, it was agreed that this location would provide the best available location for the school bus stop.

Tim Miller Associates, Inc.
10 North Street
Cold Spring, NY 10516
845-265-4400
fax: 845-265-4418

Tim Miller, AICP
Steve Marino, PWS
Stephen Lopez, AICP, RLA
James A. Garofalo, AICP
Frederick Wells, RLA
Andrew Mavian, AICP
Bonnie Franson, AICP, PP
Josh Moreinis, AICP
Jon Dahlgren
Ann Cutignola
Janell Herring
James Bates
Maureen Sacchetti
James F. Stanley
Jill M. Butler
Donna Tiffany
Doreen B. Derry

Sergio Smiriglio,
Consulting Hydrogeologist

**JOHN COLLINS
ENGINEERS, P.C.** TRAFFIC • TRANSPORTATION ENGINEERS

11 BRADHURST AVENUE • HAWTHORNE, N.Y. • 10532 • (914) 347-7500 • FAX (914) 347-7266

MEMORANDUM

To: Mr. Fred Wells, RLA
Tim Miller Associates

From: Philip J. Grealy, Ph.D., P.E. 

Date: November 19, 2004

Job No.: 724

Project: Golden Triangle Development
Exit 120 Interchange Modifications
Town of Walkill, NY

This memo serves as an update of the status of the Route 17-Exit 120 Interchange Modifications including the New Town Road in the Town of Walkill. As discussed with you, we have received favorable support from New York State Department of Transportation and have been waiting for the "final future traffic projections" for the corridor from NYSDOT Region 8 so that we can finalize the Interchange Modification Study for the completion of the process including permit issuance.

The NYSDOT has just forwarded to us the long term traffic projections for the overall area. These were updated by their consultant in association with the Exit 122 Interchange study which also addressed traffic projections along the Route 17 and Route 211 corridors. Now that we have this information (which we had been waiting for over six months), we will be proceeding with the completion of the Interchange Modification Report. The NYSDOT summarized their position on our proposed ramp modification in their letter to the Town, dated March 18, 2004.

LANC & TULLY

ENGINEERING AND SURVEYING, P.C.

December 14, 2004

Mr. Richard McGoey, PE
McGoey, Hauser & Edsall
Consulting Engineers, P.C.
33 Airport Center, Suite 202
New Windsor, NY 12550

RE: Golden Triangle

Dear Mr. McGoey:

This letter is written in response to your technical comments dated October 12, 2004 for Golden Triangle, DEIS, and Phase 1 Site Plan. The following are responses to the comments in the order in which they appear.

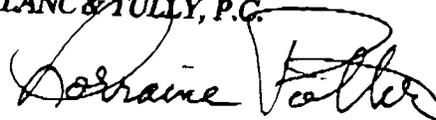
1. The Public Hearing was continued at the October 20, 2004 Planning Board meeting and closed during that meeting.
2. Fire department concerns to be addressed by Tim Miller Associates with respect to need for new fire house, etc.
3. Stormwater management engineering reports and plans are currently being prepared by our office in accordance with the latest requirements of New York State Department of Environmental Conservation and include water quality treatment, as requested.
4. Stormwater management structure details are currently being designed by our office and will be provided on the plans.
5. U.S. Army Corps of Engineers approval of wetlands and wetland mitigation areas are being coordinated through Robert Torgersen's office.
6. As a result of Mr. Torgersen's meeting with the U.S. Army Corps of Engineers, our office has revised Roads B and C to minimize the disturbance to the stream. Details are being provided on the site plan drawings.
7. Additional handicap parking spaces have been provided in the visitor parking areas.
8. A completed Landscape Plan is being prepared by Robert Torgersen and will include a schedule showing specifically identified type of species of trees as well as the caliber and/or size of planting. Plantings details will also be provided.
9. Note 1 on Sheet 5 of 11 has been provided and states that "Retainer glands are required on all fittings in addition to tie rods and thrust blocks." In addition, our office will add to this note that "locking glands will be provided on all mechanical joint fittings."
10. The manufacturer and type of fire hydrant has been specified on the Hydrant Detail.

December 14, 2004

11. Fire department comments received at the September 15, 2004 Planning Board meeting are being addressed in the DEIS by Tim Miller Associates. No further comments have been received from the fire department at this time.
12. Additional details are being provided by our office for the box culvert, road construction details for the secondary access road, sidewalk, curbing, striping, signage and all other necessary details. The design for the widening of Silver Lake Scotchtown Road are being provided by John Collins Engineers.
13. The Site Plan has been revised by our office to incorporate a 3 ft. grass strip between the curb and sidewalk within the project site.
14. Details of the pool area including fencing, paving and lighting will be included in the site plan drawings. Details of the cabana will be provided by the architect under separate cover.
15. Locations of proposed fire hydrants have been clarified on the Site Plans.
16. Should the water system connection for the first part of the project to the Tower Drive system not be available in a timely fashion, a connection with a booster station for fire protection is proposed to the existing Overhill Road tank system.
17. End sections and rip rap are being provided on the Site Plan at the discharge of storm drains into detention basins and water quality basins.
18. Floor plans for the various proposed units will be provided by Pendergast & Terach Architects to clarify the number of habitable rooms and the impact on parking.
19. Note 5 on Sheet 2 has been clarified with respect to density.
20. Appropriate notes will be added to the Site Plans indicating that cabana and pool will be constructed prior to the issuance of any Certificate of Occupancy.
21. Note 10 on Sheet 1 of the Site Plan has been revised to state "The sub-grade of the roadway will be proof rolled in the presence of the Town engineer and found to unyielding and acceptable prior to the placement of sub-base and paving."
22. Additional details for this project will be submitted to the Town of Wallkill engineer for his review.

Sincerely,

LANC & TULLY, P.C.



Lorraine Potter

LP/gjl
Enc.

cc: Gary Lake, Planning Board Chairman

COLUMBIA HERITAGE, LTD.
56 NORTH PLANK ROAD - SUITE 287
NEWBURGH, NEW YORK 12550
Tel. 888-294-4815 Fax. 845-565-9504

13 December 2004

Ms. Ann Cutignola
Tim Miller Associates, Inc.
10 North Street
Cold Spring, New York 10516

Re: Phase I Cultural Resources Survey
Golden Triangle Development - Phase I
Town of Wallkill, Orange County, New York

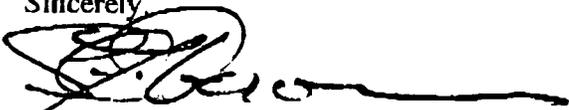
Dear Ann:

I spoke with Town of Wallkill Historian Dorothy Hunt-Ingrassia to enquire about any knowledge she might have regarding historical or archaeological resources in the area south of Silver Lake-Scotchtown Road that is being proposed for development as Phase I of the referenced project. She was familiar with the distillery I mentioned in our Phase IA site assessment report as having stood near the southeast corner of Silver Lake-Scotchtown Road and Bert Crawford Road, but did not know of any structures or other cultural resources that had stood on the property to be developed and agreed that this area had been used as pasture. I have mailed her a map showing the extent of the proposed project so she can compare it to her files and historical maps of the area. She said she would respond if she found anything of concern.

I carried out two other cultural resources surveys within less than one mile of the Golden Triangle parcel and having consulted the pertinent historical texts and maps relating to the area, I felt confident I was familiar with the distribution of historical structures and known Native American occupation sites in this part of the township. In addition, I have reviewed the Historical Information published on the Town web site.

Please let me know if you receive any written or oral input from area residents regarding cultural resources that they believe might have stood within the proposed impact area. Do not hesitate to call if you have any questions.

Sincerely,



Stephen J. Oberon
Principal Investigator

**TIM
MILLER
ASSOCIATES, INC.**

10 North Street, Cold Spring, New York 10516

Phone (845) 265-4400

Fax (845) 265-4418

November 30, 2004

Dorothy Hunt-Ingrassia
Town Historian - Town of Wallkill
6 Loch Invar Lane
Middletown, NY 10940

Re: Proposed Golden Triangle Development, Town of Wallkill, NY

Dear Ms, Hunt-Ingrassia:

Tim Miller Associates, Inc. is in the process of preparing an Environmental Impact Statement for a proposed mixed residential and commercial development in the Town of Wallkill, NY. The project is located north of Route 211 and west of Route 17, the site location is shown on the enclosed map.

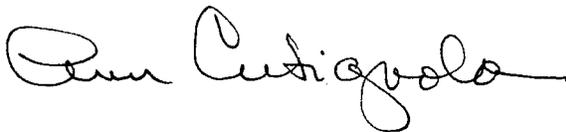
As part of the public comment on the Draft Environmental Impact Statement (DEIS), a request was made for input from the Town of Wallkill Historian as to relevant historical insight with regard to this project site.

A complete copy of the DEIS is on file with the Town of Wallkill Planning Board. I am in the process of preparing the Final Environmental Impact Statement for this project and would welcome any input you may have.

I can be reached at 845.265.4400 or at acutignola@timmillerassociates.com should you have any questions or comments.

Thank you in advance for your input with regard to this proposed project.

Sincerely,



Ann Cutignola
Associate Planner
Tim Miller Associates, Inc.

Attachments:

Site Location Map - Proposed Golden Triangle Project

**TIM
MILLER
ASSOCIATES, INC.**

10 North Street, Cold Spring, New York 10516

Phone (845) 265-4400

Fax (845) 265-4418

November 30, 2004

Mr. John Ward - Supervisor
Town of Walkill Master Plan Committee
Town of Walkill
600 Route 211 East, PO Box 398
Middletown, NY 10940

Re: Proposed Golden Triangle Development, Town of Walkill, NY

Dear Supervisor Ward:

Tim Miller Associates, Inc. is in the process of preparing an Environmental Impact Statement for a proposed mixed residential and commercial development in the Town of Walkill, NY. The project is located north of Route 211 and west of Route 17, the site location is shown on the enclosed map.

As part of the public comment on the Draft Environmental Impact Statement (DEIS), a request was made for the Town of Walkill Master Plan Committee to review the project location in the Planned Industrial Development District and confirm there was no change of zoning pending in this area.

A complete copy of the DEIS is on file with the Town of Walkill Planning Board. I am in the process of preparing the Final Environmental Impact Statement for this project and would welcome your input.

I can be reached at 845.265.4400 or at acutignola@timmillerassociates.com should you have any questions or comments.

Thank you in advance for your input with regard to this proposed project.

Sincerely,



Ann Cutignola
Associate Planner
Tim Miller Associates, Inc.

Attachments:

Site Location Map - Proposed Golden Triangle Project

**TIM
MILLER
ASSOCIATES, INC.**

10 North Street, Cold Spring, New York 10516

Phone (845) 265-4400

Fax (845) 265-4418

November 30, 2004

Ms. Roseanne Sullivan - Chairperson
Town of Walkkill Master Plan Committee
PO Box 149
46 Berry Lane
Circleville, NY 10919

Re: Proposed Golden Triangle Development, Town of Walkkill, NY

Dear Ms. Sullivan:

Tim Miller Associates, Inc. is in the process of preparing an Environmental Impact Statement for a proposed mixed residential and commercial development in the Town of Walkkill, NY. The project is located north of Route 211 and west of Route 17, the site location is shown on the enclosed map.

As part of the public comment on the Draft Environmental Impact Statement (DEIS), a request was made for the Town of Walkkill Master Plan Committee to review the project location in the Planned Industrial Development District and confirm there was no change of zoning pending in this area.

A complete copy of the DEIS is on file with the Town of Walkkill Planning Board. I am in the process of preparing the Final Environmental Impact Statement for this project and would welcome your input.

I can be reached at 845.265.4400 or at acutignola@timmillerassociates.com should you have any questions or comments.

Thank you in advance for your input with regard to this proposed project.

Sincerely,



Ann Cutignola
Associate Planner
Tim Miller Associates, Inc.

Attachments:

Site Location Map - Proposed Golden Triangle Project

**TIM
MILLER
ASSOCIATES, INC.**

10 North Street, Cold Spring, New York 10516

Phone (845) 265-4400

Fax (845) 265-4418

December 8, 2004

Ms. Eliza McKean
Middletown City School District
Board of Education
223 Wisner Road
Middletown, NY 10940

Re: Proposed Golden Triangle Development, Town of Walkkill, NY

Dear Ms. McKean:

Tim Miller Associates, Inc. is in the process of preparing an Environmental Impact Statement for a proposed mixed residential and commercial development in the Town of Walkkill, NY. The project is located north of Route 211 and west of Route 17, the site location is shown on the enclosed map.

As part of the public comment on the Draft Environmental Impact Statement (DEIS), a request was made to investigate the possibility of school buses entering the Golden Triangle townhouse development to pick up and drop off school children. The project is proposed as condominiums and as such road ownership and maintenance would be under the purview of a homeowner's association. Access to the project is from Silver Lake Scotchtown Road in the vicinity of Mud Mills Road. A complete copy of the DEIS including all project plans is on file with the Town of Walkkill Planning Board.

Please advise as to how the project sponsor may gain permission for school buses to pick up and drop off students on the interior roads of the project.

I can be reached at 845.265.4400 or at acutignola@timmillerassociates.com should you have any questions or comments.

Thank you in advance for your assistance with this matter.

Sincerely,



Ann Cutignola
Associate Planner
Tim Miller Associates, Inc.

Attachments:

Site Location Map - Proposed Golden Triangle Project

**TIM
MILLER
ASSOCIATES, INC.**

10 North Street, Cold Spring, New York 10516

Phone (845) 265-4400

Fax (845) 265-4418

December 8, 2004

Mr. Stuart Millar
Mid City Transit
513 Route 17M
Middletown, NY 10940

Re: Proposed Golden Triangle Development, Town of Walkill, NY

Dear Mr. Millar:

Tim Miller Associates, Inc. is in the process of preparing an Environmental Impact Statement for a proposed mixed residential and commercial development in the Town of Walkill, NY. The project is located north of Route 211 and west of Route 17, the site location is shown on the enclosed map.

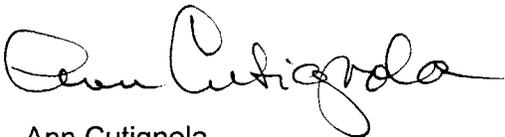
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Please advise as to how the project sponsor may gain permission for school buses to pick up and drop off students on the interior roads of the project. I have made the same request of the Board of Education for the Middletown City School District.

I can be reached at 845.265.4400 or at acutignola@timmillerassociates.com should you have any questions or comments.

Thank you in advance for your assistance with this matter.

Sincerely,



Ann Cutignola
Associate Planner
Tim Miller Associates, Inc.

Attachments:
Site Location Map - Proposed Golden Triangle Project

Tim Miller Associates, Inc.
 DAILY SHIPMENT DETAIL REPORT
 08/05/04 04:48 PM

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 Pickup Record No.: 1065850 66 0

UPS Account No.: 3025EW
 Sorted By: Order of Shipment

Name/Address	Shipment Detail	Options	Reference Rate Charges
Ship To: David Church, AICP, Commissioner Orange County Dept. of Planning 124 Main Street GOSHEN NY 10924 Ship From: Doreen Derry Tim Miller Associates, Inc. 10 North Street COLD SPRING NY 10516-3023	Service Type: UPS GROUND Total Packages: 1 Hundredweight: No Billable Wt.: 13.0 Billing Option: Prepaid Package Ref No.1: 01103	Shipment Service Charge:	\$ 5.11
	Tracking No.: 1Z3025EW0342098261 Package Type: Package Weight: 13.0 Package Ref No.1: 01103	Package Service Charge: Shipper Amt: UPS Total Charge:	\$ 5.11 \$ 5.11 \$ 5.11
Ship To: Robert Dennison New York State DOT Planning 4 Burnett Boulevard POUGHKEEPSIE NY 12601 Ship From: Doreen Derry Tim Miller Associates, Inc. 10 North Street COLD SPRING NY 10516-3023	Service Type: UPS GROUND Total Packages: 1 Hundredweight: No Billable Wt.: 13.0 Billing Option: Prepaid Package Ref No.1: 01103	Shipment Service Charge:	\$ 5.11
	Tracking No.: 1Z3025EW0342994275 Package Type: Package Weight: 13.0 Package Ref No.1: 01103	Package Service Charge: Shipper Amt: UPS Total Charge:	\$ 5.11 \$ 5.11 \$ 5.11
Ship To: NYS DEC - Region 3 Div of Environmental Permits Deputy Regional Permit Administrato 21 South Putt Corners Road NEW PALTZ NY 12561-1620 Ship From: Doreen Derry Tim Miller Associates, Inc. 10 North Street COLD SPRING NY 10516-3023	Service Type: UPS GROUND Total Packages: 1 Hundredweight: No Billable Wt.: 13.0 Billing Option: Prepaid Package Ref No.1: 01103	Shipment Service Charge:	\$ 5.11
	Tracking No.: 1Z3025EW0342336682 Package Type: Package Weight: 13.0 Package Ref No.1: 01103	Package Service Charge: Shipper Amt: UPS Total Charge:	\$ 5.11 \$ 5.11 \$ 5.11
Ship To: US Army Corps of Engineers Room 1937 Eastern Permit Division 26 Federal Plaza New York NY 10278 Ship From: Doreen Derry Tim Miller Associates, Inc. 10 North Street COLD SPRING NY 10516-3023	Service Type: UPS GROUND Total Packages: 1 Hundredweight: No Billable Wt.: 13.0 Billing Option: Prepaid Package Ref No.1: 01103	Shipment Service Charge:	\$ 5.11
	Tracking No.: 1Z3025EW0342821497 Package Type: Package Weight: 13.0 Package Ref No.1: 01103	Package Service Charge: Shipper Amt: UPS Total Charge:	\$ 5.11 \$ 5.11 \$ 5.11



New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

December 21, 2004

Carol Kelly
Town of Walkill Planning Board
P.O. Box 398
Middletown, New York 10940

Re: SEORA
Golden Triangle Residential Subdivision/Silver
Lake Scotchtown Road
Walkill, Orange County
02PR04786

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP) with regard to the potential for this project to affect significant historical/cultural resources. OPRHP has reviewed the archaeological report submitted for this project. Based on our review of that report, the OPRHP has no further archaeological concerns regarding this project.

Please note that if state and or federal permits are necessary, the project will need to be reviewed in accordance with Section 14.09 of the State Historic Preservation Act or Section 106 of the National Historic Preservation Act. While archaeological issues with the site have been addressed, it may be necessary to conduct further review for architectural resources.

Please contact me at extension 3291, or by e-mail at douglas.mackey@oprhp.state.ny.us, if you have any questions regarding these comments.

Sincerely

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

✓ Cc: Steve Oberon

From: Ann
Sent: Wednesday, December 01, 2004 4:37 PM
To: 'Roejonz@aol.com'
Cc: Fred
Subject: Town of Walkill Master Plan Review Committee

Dear Ms. Sullivan,

Tim Miller Associates prepared the DEIS for the proposed Golden Triangle Project in the Town of Walkill. The project is located immediately west of Route 17, north of Route 211 and south of Silver Lake Scotchtown Road. As part of the public comment on the DEIS, Mr. Salvatore J. La Bruna of the Walkill Conservation Commission requested the Town of Walkill Master Plan Committee be contacted to insure the project site, currently zoned as PID, Planned Industrial Development, would remain zoned as PID.

Could you please forward me a letter stating whether there are any proposed changes to the zoning in this area. If you have any questions or need additional information, I can be reached at 845.265.4400 or at acutignola@timmillerassocites.com.

Thank you in advance for your assistance in this matter.

Ann Cutignola
Associate Planner

Tim Miller Associates, Inc.
Planning • Landscape Design • Traffic • Wetlands & Ecology
Hydrogeology • Economics • Project Management • Permitting

10 North Street, Cold Spring, N.Y. 10516
845.265.4400 voice 845.265.4418 fax
url: www.timmillerassociates.com
email: dderry@timmillerassociates.com

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COUNTY OF ORANGE

DEPARTMENT OF PLANNING

EDWARD A. DIANA
COUNTY EXECUTIVE

124 MAIN STREET
GOSHEN, NEW YORK 10924-2124
TEL: (845)291-2318 FAX: (845)291-2533
WWW.ORANGECOUNTYGOV.COM/PLANNING

DAVID CHURCH, A.I.C.P.
COMMISSIONER

Gary Lake, Chairman
Town of Wallkill Planning Board
P. O. Box 398
Middletown, NY 10940

Re: Golden Triangle

Dear Mr. Lake:

Our office has received the draft EIS for the Golden Triangle Project. We reviewed the DEIS and did not have any significant comments to make on the contents of the document. It appears that the residential component will be started and completed before any of the other elements are presented for review. We will review that component as a separate review, if the project follows that route.

We will review the site plan for the residential units when the DEIS process is complete and when we know that there will be no new changes to the site plan as a result of the DEIS findings. If there will be changes, we would appreciate a new map for our consideration.

If you have any concerns or questions about our review under Section 239 l, m, & n, please contact me.

Very truly yours,


Richard J. Jones, Senior Planner

LANC & TULLY
ENGINEERING AND SURVEYING, P.C.

March 7, 2005

Mr. Richard McGoey, PE
McGoey, Hauser & Edsall
Consulting Engineers, P.C.
33 Airport Center, Suite 202
New Windsor, NY 12550

RE: Stormwater Pollution Prevention Plan
Covered Bridge at Golden Triangle
90 Unit-Townhouse Development
Silverlake Scotchtown Road

Dear Mr. McGoey:

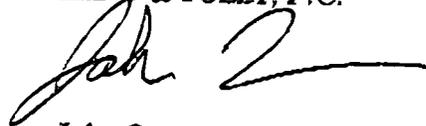
Enclosed please find one copy of the revised Stormwater Pollution Prevention Plan prepared for Covered Bridge at Golden Triangle, a 90-unit townhouse development located adjacent to the intersection of Silverlake Scotchtown Road and Mud Mills Road. Stormwater Pollution Prevention Plan has been revised as per your comment letter, page three, entitled Stormwater Management dated January 31, 2005. The items correspond to the order they were presented within your letter:

1. The pre-development watershed flow path A and resultant Tc have been revised to follow the channel flows on the U.S.G.S. mapping. Also, Fortune Road West has been revised to become the boundary of the downstream watershed analysis. The time of concentration path is conveyed by culverts, which exist under N.Y.S. Route 17, Tower Drive, and Leewood Drive. For purposes of the downstream analysis, the time of concentration and area reflect ten percent of the total area for the proposed project.
2. The site plan has been enclosed with the Stormwater Pollution Prevention Plan. Please refer to the Sheet 2 entitled, "Grading and Utility Plan", for the location and design of permanent stormwater structures. The different designs for permanent water quality treatment include several bioretention areas, a pocket pond and dry swales throughout the property.
3. The stormwater outlets, which discharge directly to the existing watercourse are sized for the higher storm events. Flow splitters have been designed within individual catch basins and drainage manholes to direct smaller intensity storms into the water quality areas. The higher storm frequencies shall bypass the water quality facilities, as this is not required for water quality treatment.
4. Details for the bioretention areas have been included on Sheet 6 of the plan set. A detail for the media has also been included.

5. The stormwater pollution prevention plan and the Erosion and Sediment Control Detail Sheet provide for temporary seeding and stabilization of disturbed areas. Only, five acres of disturbance is allowed at any one time, until such stabilization measures are utilized. Once stabilization and temporary seeding occurs disturbance of other lands may proceed. These measures are outlined on Sheet 10 of the plan set.
6. The overflow structures, which are mentioned in the narrative, refer to the catch basins within the bioretention areas for larger storm overflow. The SWPPP has been revised to clarify the meaning for these structures. A detail of these has been provided on Sheet 6 of the plan set.
7. The proposed dry swales throughout the site shall treat and attenuate the required water quality volume as indicated in Appendix D of the SWPPP. Each dry swale is to discharge to a level spreader. The level spreaders shall distribute runoff to sheet flow into the existing Federal Wetland Areas. The underdrain for the dry swales will be discharged into the existing watercourses, as the stormwater will have been treated for water quality. A detail of the dry swales has been provided on Sheet 6 of the plan set.
8. A revised Post-Development map including the full buildout and treatment facility locations has been provided within Appendix B of the SWPPP.
9. Enclosed within the SWPPP is a copy of the Site Plans. Please refer to this set for layout and design of all stormwater facilities.
10. Federal Jurisdictional Wetland Delineation is currently being pursued and shall be provided. Please refer to the attached letter from Robert Torgersen, LA, CPESC regarding this matter.

Sincerely,

LANC & TULLY, P.C.



John Queenan
Project Engineer

JQ/gjl

Enc.

cc: Gary Lake, Planning Board Chairman

**TIM
MILLER
ASSOCIATES, INC.**

10 North Street, Cold Spring, New York 10516

Phone (845) 265-4400

Fax (845) 265-4418

April 2, 2005

Dorothy Hunt-Ingrassia
Town Historian - Town of Wallkill
6 Loch Invar Lane
Middletown, NY 10940

Re: Proposed Golden Triangle Development, Town of Wallkill, NY

Dear Ms. Hunt-Ingrassia:

As a follow up to my letter of November 30, 2004, Tim Miller Associates, Inc. has prepared an Environmental Impact Statement for a proposed mixed residential and commercial development in the Town of Wallkill, NY. The project is proposed to be located north of Route 211 and west of Route 17; the site location is shown on the enclosed map.

As part of the public comment on the Draft Environmental Impact Statement (DEIS), a request was made for input from the Town of Wallkill Historian as to relevant historical insight with regard to this site.

In response to further inquiry by the Town Planning Board for a written response from you, I have tried to contact you by phone at 845-692-4862 on the following dates March 14, March 28, and April 2, 2005. I understand it is possible you are out of town for the winter. As part of the DEIS the cultural resource consultant for the project, Mr. Steve Oberon completed a historical review of the project including the information you published on the Town of Wallkill web site, and the New York State Office of Parks and Historic Preservation has indicated they have further concerns regarding the cultural resources on the project site.

I am in the process of finalizing the Final Environmental Impact Statement for this project but would still welcome any input you may have. A complete copy of the DEIS is on file with the Town of Wallkill Planning Board.

I can be reached at 845.265.4400 or at acutignola@timmillerassociates.com should you have any questions or comments.

Thank you in advance for your input with regard to this proposed project.

Sincerely,



Ann Cutignola
Associate Planner
Tim Miller Associates, Inc.

Attachments:
Site Location Map - Proposed Golden Triangle Project

ROBERT H. SIGLER, JR.
Superintendent of Schools



223 Winter Av
Middletown, NY 10940
Phone (914) 341-
Fax (914) 346-
rsigler@warwic

April 19, 2000

Members of the Planning Board
Town of Wallkill

Dear Planning Board Members,

I appreciate the communication from Mr. Doug Dulgarian of your group which provided information on a number of planned housing units in the Town of Wallkill. My letter is to inform you of the implications of this construction to the Enlarged City School District of Middletown.

First, let us presume the following units will be approved and constructed:

1. 202 homes - Clubside, Golf Links Rd.
2. 197 units - Todd Mills, Tower Dr.
3. 60 homes - Canterbury Knolls
4. 31 homes - Lakeside Village
5. 5 homes - Coutant Rd

Total units = 495

Using current data that indicates there are approximately 12,386 residential units in the school district (including TOW), and we have approximately 6,314 students, one can presume 1.96 school-aged children per unit. If we projected this number against the 495 prospective housing units, we can estimate an increase of more than 970 students from the proposed housing units.

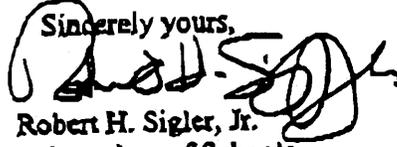
Presently, the total annual cost to educate a student in our school district is between \$10,500 and \$11,000. Notwithstanding the cost of a facility to house almost a thousand more students, the cost for this added population would exceed \$10.1 million. If this population required special services, if any are limited in their English proficiency, or if we have to provide additional facility space, the cost would be higher.

Not counting additional tax revenue generated by new construction, the local property tax impact would approach 13 percent per year, after subtracting State and Federal aid amounts.

*Rec'd
4-19-00*

I hope you find this information useful in your deliberations.

Sincerely yours,

A handwritten signature in black ink, appearing to read "R. H. Sigler, Jr.", written in a cursive style.

Robert H. Sigler, Jr.
Superintendent of Schools

PW-AC - file

ELIZABETH MCKEAN
School Business Administrator



COPY

223 Wisner Avenue
Middletown, NY 10940-3298
Phone (845) 341-5693
Fax (845) 341-5623
emckean@ecsdnm.org

May 2, 2005

Ms. Ann Cutignola, Associate Planner
Tim Miller Associates, Inc.
10 North Street
Cold Spring, N.Y. 10516

Dear Ann:

Thank you for the most recent site plan for the proposed residential development at the Golden Triangle site. I appreciate that you have tried to create an adequate turning area on private property for a school bus, however, the District must maintain its position that we cannot travel on private roads. In order for us to enter your development the roads would need to be maintained and taken over by the town.

If you have any further questions, please feel free to contact me at 845-341-5693.

Sincerely,

Elizabeth McKean
School Business Administrator

EM:le

Cc: Board of Education
John Donoghue
Stuart Millar – Mid-City Transit Corp.

**JOHN COLLINS
ENGINEERS, P.C.** TRAFFIC • TRANSPORTATION ENGINEERS

11 BRADHURST AVENUE • HAWTHORNE, N. Y. • 10532 • (914) 347-7500 • FAX (914) 347-7266

May 6, 2005

Mr. Gary Lake, Chairman
Town of Wallkill Planning Board
600 Route 211 East
PO Box 398
Middletown, NY 10940

Re: Golden Triangle
Wallkill, NY

Dear Mr. Lake:

We are in receipt of a May 2, 2005 letter from the Town of Wallkill Commission for Conservation of the Environment and are responding to the comments regarding traffic listed under the same headings in their letter.

Findings - Item 2 - Traffic

Response:

As the Board is aware, the traffic data utilized in the Golden Triangle Traffic Study is based on the Comprehensive Traffic Study (CTS) prepared by our office April 30th, 2003 and included traffic data collected during the months of January, March and April of 2003. Other traffic data has been collected by our office in association with other studies for the area and covered several other months of the year including August, October and December. The data in the CTS has been used to formulate the traffic improvements for the entire area both with and without the Golden Triangle project and seasonal variations in traffic have been accounted for in the Traffic Study. This study has been accepted for other projects by the Planning Board and has also been accepted by the New York State Department of Transportation.

Furthermore, the traffic projections contained in the study are based on accepted standards and contrary to the comment represent an accurate projection of future traffic condition. It should also be noted that this data has been coordinated with the NYSDOT based on the traffic data contained in their ongoing studies for the area including the Exit 122 interchange study.

Recommendations - Item 2

Response:

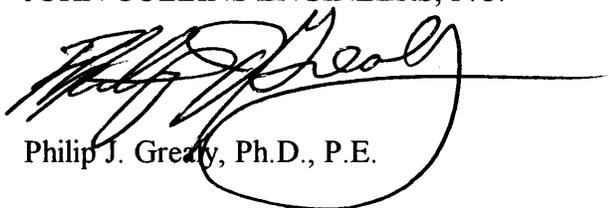
The methodology and procedures used in the Golden Triangle traffic studies contained as part of the environmental documents are based on accepted current traffic engineering standards including the referenced publication entitled Guidelines for Preparing Traffic Impact Studies. In fact, as indicated previously the traffic data used has been coordinated with and accepted the NYSDOT.

In summary, the traffic analysis contained in the DEIS and FEIS provides an analysis of existing and future conditions with and without the proposed Golden Triangle development and identifies various improvements needed to serve continued increases in traffic. It has been utilized as the basis for formulating improvements for the area including signalization, turning lanes as well as the proposed connector road interchange modifications for Phase II of this proposed development.

If you have any questions regarding this, we would be happy to discuss with you.

Sincerely,

JOHN COLLINS ENGINEERS, P.C.

A handwritten signature in black ink, appearing to read "Philip J. Grealy", is written over a horizontal line. The signature is stylized and cursive.

Philip J. Grealy, Ph.D., P.E.

cc: D. McGoey, P.E.

From:40LHO1368

07/15/2005 08:03 #078 P.002/006



DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0080

JUL 15 2005REPLY TO
ATTENTION OF:

Regulatory Branch

SUBJECT: Permit Application Number 2002-00790-YS
by Golden Triangle Developers LLC

Robert G. Torgersen
Landscape Architecture and
Environmental Services
Three Main Drive
Nanuet, New York 10954

Dear Mr. Torgersen:

On March 5, 2002, the New York District Corps of Engineers received a request for a Department of the Army jurisdictional determination and authorization for the above referenced project. This request was made by Robert G. Torgersen, as consultant for Golden Triangle Developers LLC. The site consists of approximately 92.73 acres, in the Hudson River watershed, located on Silver Lake-Scotchtown Road in the Town of Wallkill, Orange County, New York. The proposed project would involve the construction of residential developments to be known as Covered Bridge at Golden Triangle on the western-most 18.8 acres of the overall property. No other development is proposed on the property at this time.

In the letter received on March 5, 2002, your office submitted a proposed delineation of the extent of waters of the United States within the subject property. A site inspection was conducted by a representative of this office on July 31, 2002, in which it was agreed that changes would be made to the delineation and that the modified delineation would be submitted to this office. On June 2, 2005, this office received the modified delineation.

Based on the material submitted and the observations of the representative of this office during the site visit, this site has been determined to contain jurisdictional waters of the United States based on: the presence of wetlands determined by the occurrence of hydrophytic vegetation, hydric soils and wetland hydrology according to criteria established in the 1987 "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1 that are either adjacent to or part of a tributary system; the presence of a defined water body (e.g. stream channel, lake, pond, river, etc.) which is part of a tributary system; and the fact that the location includes property below the ordinary high water mark, high tide line or mean high water mark of a water body as determined by known gage data or by the presence of physical markings including, but not limited to, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter or debris or other characteristics of the surrounding area.

From: 40LH01368

07/15/2005 08:03 #078 P.003/006

These jurisdictional waters of the United States are shown on the drawing entitled "Wetlands Location For Interchange Modification New York State Route 17, Town of Wallkill, County of Orange, State of New York", prepared by Daniel P. Yanesh N.Y.S. L.S., dated August 29, 2002, and last revised June 10, 2003. This drawing indicates that there are three (3) principal wetland areas on the project site which are part of a tributary system, and are considered to be waters of the United States.

The first wetland (flag numbers A-01 through A-100 and A-112 through A-129) includes an unnamed tributary to Masonic Creek, is located along the western property line and is a total of approximately 5.61 acres within the subject property. The second wetland (flag numbers B-1 through B-22A and an intermittent stream which flows to Masonic Creek) is located approximately 400 feet southeast of the first wetland and is approximately 2.20 acres within the subject property. The third wetland (flag numbers C-1 through C-64, D-1 through D-37 and an intermittent stream which connects the two flag series) is located near the center of the property, stretching from the eastern property line (at New York State Route 17) to the southern property line, and is approximately 6.28 acres within the subject property. These wetlands are considered to be above the headwaters.

It should be noted that, in light of the recent U.S. Supreme Court decision (Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, No. 99-1178, January 9, 2001), the remainder of the wetlands shown on the above referenced drawing (flag numbers E-1 through E-9) do not meet the current criteria of waters of the United States under Section 404 of the Clean Water Act. The Court ruled that isolated, intrastate waters can no longer be considered waters of the United States, based solely upon their use by migratory birds.

This determination regarding the delineation shall be considered valid for a period of five years from the date of this letter. Enclosed is a Notification of Administrative Appeal Options which provides information on your acceptance of this approved jurisdictional determination.

This delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

From:4QLH01368

07/15/2005 08:04 #078 P.004/006

The drawing entitled "Wetland Impact Plan Covered Bridge at Golden Triangle Town of Wallkill Orange County, New York", prepared by Lanc & Tully Engineering and Surveying, P.C., dated ~~March 17, 2004, and last revised May 18, 2005, indicates that a~~ town-house development would be constructed on the western-most 18.8 acres of the overall property. This drawing also indicates that the total impacts to waters of the United States would involve the discharge of fill material into a maximum of 0.33 acres of wetlands and other waters, including approximately 150 linear feet of streams. In addition, approximately 0.03 acres of wetlands would be temporarily impacted for the installation of three separate utility lines, and would be returned to pre-construction contours.

The above referenced drawing and the drawings entitled "Covered Bridge at Golden Triangle Town of Wallkill, Orange County, NY": "Wetland Mitigation Cross Sections" and "Wetland Mitigation Planting Details", both prepared by Robert G. Torgersen A.S.L.A. Landscape Architecture & Environmental Sciences, dated May 7, 2004, and last revised May 18, 2005, indicate that approximately 0.82 acres of wetlands would be established as mitigation.

Based on the information submitted to this office, and accomplishment of notification in accordance with the applicable federal requirements, our review of the project indicates that an individual permit is not required. It appears that the activities within the jurisdiction of this office could be accomplished under Department of the Army Nationwide General Permit Number 39. The nationwide permits are prescribed as an Issuance of Nationwide Permits in the Federal Register dated January 15, 2002 (67 FR 2020). The work may be performed without further authorization from this office provided the activity complies with the permit conditions listed in Section B, No. 39, Section C, any applicable New York District regional conditions, the following special conditions, and any applicable regional conditions added by the State of New York, copies enclosed.

Special Conditions

(A) The permittee shall provide to this office annual reports on the status of the mitigation activities, prepared during the growing season, no later than October 31 in each of the following five (5) years after initiation of the activities authorized by this letter. These reports shall include the following at a minimum:

i. All plant species, along with their estimated relative frequency and percent cover, shall be identified by using plots measuring 10 feet by 10 feet with at least one representative plot located in each of the habitat types within the mitigation site. The location of each plot shall be identified on the plan view engineering drawing.

ii. Vegetation cover maps, at a scale of one inch equals 100 feet, or larger scale, shall be prepared for each growing season.

From:40LH01368

07/15/2005 08:04 #078 P.UUb/UUb

iii. Photographs showing all representative areas of the mitigation site/s shall be taken at least once each year during the period between 1 June and 15 August.

iv. Surface water and groundwater elevations in representative areas of the mitigation site/s shall be recorded twice a month during April through September of each year. The location of the monitoring well or gauge shall be shown on the plan view engineering drawing.

(B) All grading and planting in conjunction with the wetlands mitigation work shall be completed prior to the completion of the discharge of fill authorized herein.

(C) The permittee shall ensure that all plantings in conjunction with the mitigation effort shall have an eighty-five (85) percent survival and/or coverage rate which must be met or exceeded at the end of the second growing season following the initial planting/seeding of each phase. If the eighty-five (85) percent survival rate is not met at the end of the second growing season following each phase, the permittee shall take all necessary measures to ensure the level of survival by the end of the next growing season, including re-planting and re-grading if necessary. In addition, in areas where no individual plantings are currently proposed, if appropriate and sufficient vegetation is not present by the end of the second growing season, the permittee shall take all necessary steps, including individual plantings in order to achieve a plant density comparable to the adjacent wetland.

(D) The permittee shall ensure that no mowing of the mitigation area shall occur.

(E) The permittee shall undertake the authorized filling activities in a manner aimed at reducing impacts upon the general environment. In addition, the permittee shall not stockpile fill or other materials in a manner conducive to erosion, or in areas likely to cause high turbidity runoff during storm events. All exposed soils shall be re-vegetated in a timely manner to further reduce potential effects. The permittee shall also fence off all wetlands and other sensitive ecological areas during construction periods to prevent equipment and personnel from entering these areas.

(F) The permittee shall secure a conservation easement or deed restriction on the wetland mitigation site to guarantee its preservation for wetland and wildlife resources. Copies of the instrument(s) effecting such easement shall be submitted to the New York District Corps of Engineers for approval prior to execution, and the instrument(s) shall be executed and recorded with the Orange County Registrar of Deeds within one year following the initial plantings/seedings of the mitigation site.

From:40LHO1368

07/15/2005 08:05 #078 P.006/006

(G) The permittee shall assume all liability for accomplishing the corrective work should the New York District determine that the compensatory mitigation has not been fully ~~satisfactory. If the New York District does not find the~~ mitigation satisfactory, an extension of monitoring time may be required to cover any necessary remedial work.

This determination covers only the work described in the submitted material. Any major changes in the project may require additional authorizations from the New York District.

Care should be taken so that construction materials, including debris, do not enter any waterway to become drift or pollution hazards. You are to contact the appropriate state and local government officials to ensure that the subject work is performed in compliance with their requirements.

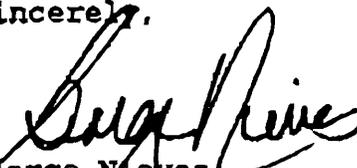
This verification is valid for a period of two years from the date of this letter, unless the nationwide permit is modified, suspended or revoked. This verification will remain valid for two years from the date of this letter if the activity complies with the terms of any subsequent modifications of the nationwide permit authorization. If the nationwide permits are suspended, revoked, or modified in such a way that the activity would no longer comply with the terms and conditions of a nationwide permit, and the proposed activity has commenced, or is under contract to commence, the permittee shall have 12 months from the date of such action to complete the activity.

This authorization is conditional on the applicant's receipt of the required water quality certificate or waiver from the New York State Department of Environmental Conservation (NYSDEC). No work may be accomplished until the required approval from NYSDEC has been obtained.

Within 30 days of the completion of the activity authorized by this permit and any mitigation required by this permit, you are to sign and submit the attached compliance certification form to this office.

If any questions should arise concerning this matter, please contact Brian A. Orzel, of my staff, at (917) 790-8413.

Sincerely,


George Mieves
Chief, Western Permits Section

Enclosures

cf: NYSDEC - Region 3
Town of Wallkill

Main Identity

From: "Edwin Estrada" <estradae@pbcpsy.com>
To: <ESW@FRONTIERNET.NET>
Sent: Tuesday, January 31, 2006 7:06 PM
Attach: Middletown City School District Cost Per Student.doc
Subject: FW: student information

Hi Doug,

I had some trouble sending the above attachment from my home computer so I sent it to my work computer and forwarded on to you. Let me know if the attachment doesn't come out right.

The school district's business administrator Betsy McKean wanted me to let you know that a cost per student approach has many variations. She used the most simple approach by dividing the number of students enrolled as of October 2005, 7070, into the 2005-2006 budget. You will see figures cost per student figures both prior to and after state, federal and other aid/income.

As a follow up to our earlier conversation, I wanted to let you know that the Board of Education and other district officials met with the Mayor of Middletown, the City Council and other officials. The Mayor reported that 389 senior apartments and 893 new family housing units have already been approved by the planning board. This includes 421 single family dwellings, 312 condo units and approximately 200 apartment units. Much of the developments are scheduled for the other side of the city near Mt. Carmel and County Route 78.

Although I know this is not of concern for the Town of Wallkill, I offer it as information as the planning strategies for the school district cannot be specific to any one development but any conversation must encompass all proposed developments within the districts boundaries in the Town of Wallkill and the City of Middletown. I hope this information is useful and if anyone requires additional information let me know. It is our hope to set up a meeting between the Board of Education, district officials and all Town officials, including the Planning Board, Town Board and Town Supervisor. Thanks again.

Ed Estrada
Middletown City School District
Board of Education

-----Original Message-----

From: estradae@frontiernet.net [mailto:estradae@frontiernet.net]
Sent: Tue 1/31/2006 6:50 PM
To: Edwin Estrada
Cc:
Subject: student information

This message and any attachments contain confidential or privileged information which is intended for the recipient named above. If you are not the intended recipient, any disclosure, copying, use, or distribution of the information included in this message and any attachments is prohibited. If you have received this communication in error, please notify us by reply e-mail and immediately and permanently delete this message and any attachments.

2/1/2006

Middletown City School District
Cost Per Student Information

	<u>2001-02</u>	<u>2002-03</u>	<u>2003-04</u>	<u>2004-05</u>	<u>2005-06</u>
Budget	81,921,560	85,619,644	87,490,399	92,651,231	99,060,624
% Increase (Budget)	5.40%	4.51%	2.18%	5.90%	6.92%
Tax Levy	34,132,475	36,482,214	37,939,096	43,469,582	46,247,235
Levy as % Of Budget	41.66%	42.61%	43.36%	46.92%	46.69%
Tax Levy Inc. or (Dec.)	3.34%	6.88%	3.99%	14.58%	6.39%
Wallkill \$ Portion Of Levy	16,536,294	16,385,162	16,859,026	20,727,696	20,969,738
Wallkill % Portion Of Levy	50.03%	46.10%	44.53%	47.72%	45.25%
Wallkill Equalization Rate	0.3316	0.2969	0.29	0.24	0.2134
Wallkill Tax Rate	70.461425	65.945614	66.210463	80.759832	80.596112

Total Budget 2005-2006 School Year: \$99,060,624.00
Student Enrollment – October 2005: 7,070 Students
Cost per student before aid: \$ 14,011.00

SUMMARY

Budget Total 2005-2006 School Year:	\$99,060,624.00
Less Budgeted State, Federal Aid:	\$43,307,162.00
Less Est. Medicaid Reimbursements:	\$ 825,000.00
Less Payment in Lieu of Taxes:	\$ 4,692,000.00
Less Fund Balance:	\$ 3,989,000.00
Balance after State, Federal & other aid (Levy):	\$46,247,235.00
Cost Per Student After State, Federal & Other Aid:	\$ 6,541.00



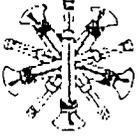
Appendix B

Written Comments
Received on the DEIS

Index of Written Comments Received on the DEIS

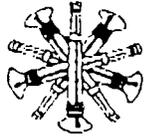
Letter #	Author	Date
1	Jeffry Jaques, Chief, Silver Lake Fire District	Undated
2	J.D. Hohman, PE, New York State Thruway Authority	8/24/04
3	Nina Guenste, Chairman, Town of Wallkill Conservation Commission	9/15/04
4	Salvatore J. LaBruna, Town of Wallkill Conservation Commission	Undated
5	Richard D. McGoey, PE, Planning Board consultant	10/12/04
6	Edwin A. Estrada, Middletown Board of Education	10/20/04
7	Salvatore J. LaBruna, Town of Wallkill Conservation Commission	5/2/05

FS: Index of comment ltrs GT.lwp



SILVER LAKE FIRE DISTRICT

26 Maltese Drive • Middletown, New York 10940
Business 815-313-7131



OFFICE OF THE CHIEF

DERRICK HAMMOND
Assistant Chief
car2@silverlakefd.com

JEFFRY JAQUES
Chief of Department
car1@silverlakefd.com

VINCENT BRENNAN III
Assistant Chief
car3@silverlakefd.com

Golden Triangle

To Whom It May Concern:

Comment
6-1

After further review of the proposed Golden Triangle Project it has become apparent that this project will greatly impact the Silver Lake Fire Department. Some facts that I would like to discuss are the fact that our Department is 100 Percent volunteer, we currently operate out of an outdated fire house in which we have outgrown; we also currently operate a 1990 Ladder which is due for replacement.

Our Department currently operates with approximately 35 active volunteer firefighters. In the 1980's our department operated with 50 active volunteers. Every year this number has dwindled at an alarming rate. In the current EIS report it is stated that "based on published standards, approximately 2.3 firefighters would be needed". If the fire District were to hire 2 paid firefighters it would cost the District approximately \$140,000 per year.

Our present firehouse was built in 1964, the current size of this house will not outfit newly designed ladder trucks due to changes in the NFPA 1901 standards for safety and enhancement features. Also due a heavier amount of required reports and files our current office space has also become extremely too small for our departments needs. Our district is presently researching the possibilities of building a new firehouse which has an estimated cost of \$6 million. Our current working budget is \$500,000 per year. This project is expected to be 100 percent bonded.

Our department currently operates two engines, one ladder truck, one heavy rescue truck, and two utility vehicles. Our 1990 ladder truck is due for replacement. A new ladder truck would cost approximately \$700,000 to \$900,000.

FAX
845-343-3148

www.silverlakefd.com

EMERGENCY
Dial: 911

Comment 6-1



In closing, the current EIS report states that "tax revenue generated by the proposed developments would offset costs associated with the cumulative development". I feel that the facts stated above clearly show that in order for your development to be protected to the highest standard our department must make some costly changes. At this time we would like to request some additional time to further review this EIS report. We would enjoy sitting down and discussing this situation further with you. Please feel free to contact me directly.

Jeff Jacques
Chief of Department

 **COPY**



New York State Thruway Authority

John L. Buono
Chairman

Nancy E. Carey
Board Member

John R. Riedman
Board Member

Michael R. Fleischer
Executive Director

New York Division
4 Executive Boulevard
Suffern, NY 10901

www.thruway.state.ny.us

John T. Brizzell, P.E.
Deputy Executive
Director

Ramesh Mehta, PE
Division Director
Phone (845) 918-2500
Fax (845) 918-2594

August 24, 2004

Ms. Mary Lynn Hunt, Secretary
Town of Wallkill Planning Board
PO Box 398
600 Route 211 East
Middletown, NY 10940

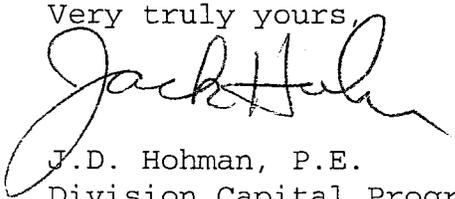
RE: Golden Triangle Development
DEIS Review
MP I84 19.1; Town of Wallkill

Dear Ms. Hunt:

We have received the subject information transmitted on August 4, 2004 from Tim Miller Associates, Inc. The Authority has co-jurisdiction of I-84 with the NYSDOT. We have no objections to the project and defer to the NYSDOT Region 8 for transportation related and other comments for Route 211 and Route 17.

Thank you for the opportunity to provide comments. Should you have any further questions, please contact me at 845-918-2504.

Very truly yours,



J.D. Hohman, P.E.
Division Capital Program Management

JDH:an

Cc: Mr. R. Mehta.
Mr. F. Wells, Sr., Tim Miller Associates



Town of Wallkill

600 Route 211 East • P.O. Box 398 • Middletown, New York 10940

LETTER # 4

OCT 18 2004

Commission for Conservation of the Environment

Claude Braithwaite ~ Jon Paul Haurich ~ Salvatore LaBruna ~ Michael Leary ~ Patricia Owen ~ Kevin Sumner

To: Planning Board of the Town of Wallkill
600 Route 211 East
P.O. Box 398
Middletown, NY 10940

Re: The Draft Environmental Impact Statement for the "Golden Triangle" project

General Comments:

Comment
5-7

One of this commission's primary concerns with the "Golden Triangle" project is the effect this development will have on local traffic. The roadway and intersection upgrades proposed in the DEIS may ease existing traffic problems, but these improvements are not sufficient enough to prevent further congestion that would inevitably result from the commercial development of Phase II and other pending projects in the immediate vicinity. The members of this commission are not convinced, as some members of the planning board are, that the proposed Town road from Silver Lake Scotchtown Road to Route 211 will improve traffic conditions in the area of this project. Furthermore, the uncertainty regarding the proposed alteration of the Exit 120 interchange on Route 17 makes it very difficult to assess the effects this project will have on local traffic patterns.

Comment
4-3

The DEIS indicates, though we strongly disagree, that the project "will help alleviate traffic circulation in the area, and associated air quality effects," yet there is no mention of the effects of clearing 96 acres of woodland will have on air quality. For those living in the Silver Lake area, the undeveloped site currently acts as a buffer against noise and air pollution emanating from Route 17. These conditions should have been addressed, or at least mentioned, in section 3.3 of the DEIS entitled "Air Resources."

Comment
3-1

Given that approximately 52 acres of the project site will be covered with impervious surfaces, stormwater runoff is another area of serious concern. The Executive Summary of the DEIS notes that the basins to be employed are designed to remove 80% of suspended solids from runoff after site stabilization. It should also be noted in this context that the practices in New York State's Design Manual typically remove in the range of 40 to 60% of dissolved pollutants. Since developments of this nature can increase pollutant loadings greatly compared to pre-development levels and that many of the pollutants of concern occur in the dissolved form, significant increases in pollutant export can potentially be expected from such sites even after runoff passes through a stormwater management practice. At this point we would like to point out that runoff from this site will enter Silver Lake where overflow will then drain into the Wallkill River and ultimately end up in the Hudson River.

Findings:

After studying the Draft Environmental Impact Statement for the "Golden Triangle" project, The Town of Wallkill Commission for Conservation of the Environment has found the following:

1. This project has not been referred to the Orange County Planning Department. According to the department's commissioner, David Church, "to the best of our knowledge, we have yet to receive a referral for advice or formal review as required on any recent proposal and/or environmental impact statement." The Planning Department is the most qualified agency to judge the project's potential cost to community services and they should be given an opportunity to do so.
2. The DEIS seems to indicate that large storm *quantity* control will not be required, and only *quality* control for smaller storms will be put into place. The DEIS justifies the lack of quantity control by claiming the "peak" output from this site will pass through Silver Lake before the peak from the entire Silver Lake watershed reaches that body of water. The time difference in these peaks, based on hydrology computer models, is about one hour. However, models are idealized representations of the way rainfall comes and the way runoff occurs. We recognize that use of these models is accepted for this purpose, but it should be remembered that there are many variables that could impact the timing and nature of peak flows. There are additional concerns beyond just the timing of the peak. The overall volume of runoff relative to infiltration will be shifted significantly. We believe the most effective way to deal with these potential changes in runoff patterns is to mimic the pre-development runoff patterns as closely as feasible using a combination of stormwater management practices on the site. This approach might be considered beyond the minimum New York State requirements, but is not unreasonable given the size and nature of this project.
3. The DEIS does not give a detailed description of a proposed approach for maintenance of the stormwater facilities. This is an important issue since any anticipated pollutant removal performance will hinge on future maintenance. The applicant should propose a mechanism for this. If it's the homeowner association's responsibility, there should be some provision for the Town to step in and perform the maintenance and get their expenses recouped if the association fails to do it.
4. The USDA Soil Survey shows significant areas of "hydric" soils on the project site. Hydric soils are likely to meet the federal criteria for wetlands. The applicant has apparently conducted on-site wetland mapping which normally would be expected to be more accurate than the Soil Survey. It is difficult to further evaluate any potential discrepancy between the Soil Survey and the applicant's mapping without reviewing a more detailed map of their wetland delineation. The DEIS notes that a jurisdictional determination from the Army

Comment
2-6

Comment
3-2

Comment
2-7

Comment
4-4

Corp of Engineers has been requested. If additional attention to this matter is deemed prudent, the Town may wish to request that ACOE include a field visit in their review of the applicant's delineation.

Comment
2-8

5. The Town of Wallkill Historian Dorothy Hunt-Ingrassia was not contacted for the Cultural Resources Survey. Contacting the historian should have been the first step for the cultural resources consultant. A town historian is the unique position of having access to traditional historical data not found in the texts cited by the consultant. Although the Conservation Commission does not dispute the findings of the survey, the Planning Board should ensure that planners follow this recommended course of action in the future for projects of this magnitude.

Recommendations:

The Town of Wallkill Commission for Conservation of the Environment recommends that this project should NOT receive any form of approval until the following conditions have been met:

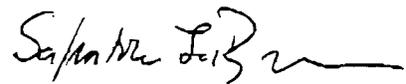
Comment
5-8

Comment
2-9

1. The project must be referred to the Orange County Planning Department for review as required and that agency should have time to assess the proposal.
2. The project engineer must address this commission's significant concerns regarding stormwater runoff.
3. The proposed modifications to the Exit 120 interchange on NYS Route 17 must receive formal approval from the New York State Department of Transportation and the Federal Highway Administration.
4. The ongoing Town of Wallkill Master Plan review should be completed so this board can be certain the property will remain zoned as Planned Interchange Development. However, a guarantee from the Master Plan Review Committee that the project site will remain zoned PID would be sufficient.
5. A Final Environmental Impact Statement should be produced, preferably by an independent planner and at the expense of the project sponsor, addressing the above mentioned deficiencies in the DEIS.

We would like to thank the Planning Board for allowing us the opportunity to evaluate this proposed project and submit our comments.

Sincerely,



Salvatore J. LaBruna
Town of Wallkill
Conservation Commission



McGOEY, HAUSER and EDSALL
CONSULTING ENGINEERS P.C.

RICHARD D. MCGOEY, P.E. (NY & PA)
WILLIAM J. HAUSER, P.E. (NY & NJ)
MARK J. EDSALL, P.E. (NY, NJ & PA)
JAMES M. FARR, P.E. (NY & PA)

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New Windsor, New York 12553

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fax: (845) 567-3232
e-mail: mheny@mhepc.com

TOWN OF WALLKILL
PLANNING BOARD
TECHNICAL REVIEW COMMENTS
DEIS AND PHASE I SITE PLAN

PROJECT NAME: GOLDEN TRIANGLE
PROJECT NUMBER: 02-74
TAX LOT: 40-1-35, 40-1-45, 50-1-62
COMMENTS PREPARED: 12 OCTOBER 2004
MEETING DATE: 20 OCTOBER 2004
ENGINEER: LANC & TULLY, TIM MILLER ASSOCIATES

1. The public hearing for this project was opened on the 15th of September 2004 and left open.
2. The Fire Department has raised concerns with respect to manpower equipment and the need for a new firehouse which should be addressed in the DEIS and FEIS.
3. During our work session of 20 September we requested that the stormwater management engineering report and plans be submitted in accordance with the latest requirements of NYSDEC to include water quality treatment which does not presently appear on the site plan.
4. Stormwater management structure details should be provided with the plans.
5. Status of Army Corps approvals of the wetlands and wetland mitigation areas is to be provided.
6. The Board should be aware that the comments from the Army Corps has resulted in a change of the site plan, Road B and Road C, to avoid the need to cover the stream.
7. We recommended that handicap parking spaces be provided in the visitor parking areas.
8. We previously recommended that the landscape plan be reviewed by a third party landscape architect. This should be discussed. The landscape plan is in complete. A schedule should be shown specifically identifying the type and species of tree as well as the caliper and/or size of the planting. Planting details should also be provided.
9. Water system details should include a note that locking glands will be provided on all mechanical joint fittings.
10. The manufacturer and type of fire hydrant is to be specified. Other than just a note, "to meet fire department requirements".
11. All fire department comments should be addressed.

Town of Wallkill
GOLDEN TRIANGLE

-2-

12 October 2004

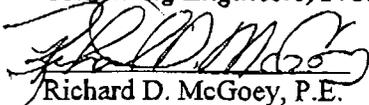
12. Substantially more detail is required to continue including, not limited to the cover bridge details, box culvert details, striping and signage, geometric details for the roadway, details of construction of the emergency access road, sidewalk and curb details.
13. We would recommend that a three foot grass strip be provided between the curb and sidewalk where practical.
14. Details of the cabana and pool area inside the building limits are to be shown including fencing, paving, lighting, etc.
15. Fire hydrants have not been shown or are otherwise unclear.
16. We understand that the watermain along Scotch Town Silver Lake Road are to be installed as part of another project. We should discuss how water will be made available to the Golden Triangle Phase I project if the other project is not successful in completing the watermain in a timely fashion.
17. End sections and rip rap should be provided at the discharge of storm drains into detention basins and water quality basins.
18. We would recommend that the floor plan of the various units proposed be provided for a determination of the number of habitable rooms and how same may impact the parking.
19. Note 5 on Sheet 2 is confusing with respect to density. Density is based on the number of bedrooms.
20. Appropriate notes should be provided which indicate that the cabana and pool area will be constructed prior to the issuance of any Certificates of Occupancy.
21. Note 10 on Sheet 1 should indicate that the proof roll shall be found to be unyielding.
22. Our office will continue our review as additional details are provided.

ACTIONS REQUIRED BY THE PLANNING BOARD

1. The Planning Board attorney should advise as to appropriate action with respect to SEQRA.

Respectfully submitted,

*McGoey, Hauser & Edsall,
Consulting Engineers, P.C.*



Richard D. McGoey, P.E.

Principal
RDM:klh

BOARD OF EDUCATION

223 Wisner Avenue
Middletown, NY 10940-3298
Phone (845) 341-5346
Fax (845) 344-6298



October 20, 2004

Town of Walkill Planning Board
600 Route 211 East
Middletown, New York 10940

Honorable Members of the Town of Walkill Planning Board,

Thank you for the opportunity to comment on the "Golden Triangle Phase I Development Project."

First, the Enlarged City School District of Middletown would like to state that we address you with appreciation for allowing us to participate in your Town's planning and development through this letter and our comments tonight. Second, by our presence here tonight, we are *not* attempting to modulate or stop any growth or construction within the Town of Walkill. The Middletown City School District would simply like to request that some form of planning time be given to allow our school district the ability to continue planning and preparing for the anticipated growth from the Golden Triangle and other housing projects currently before your Board.

Comment
6-4
↓

As we know it, it is estimated that the Golden Triangle project would yield an estimated 30-75 new students to our school district. Although, by itself, this project appears to have only minimal impact, projected development from all of the Town of Walkill

Comment
6-4

housing projects that reside within the Middletown School District would have significant impact on our infrastructure and educational programs.

One example of a project causing us concern is the impact on our district from the Tower Ridge apartment complex. With one hundred and ninety-eight apartments and depending on who you go to for student estimates, we understand that student enrollment from this project alone, could be from 100 to 250 students. More analysis is necessary to arrive at a more dependable number and then to plan the appropriate response by the school district to that growth potential.

The Enlarged City School District of Middletown is, for all practical purposes, surrounded by the effects of the Town of Wallkill's growth and development. Our high school is currently severely overcrowded and we have a capital improvement program that will expand the building to a rated capacity of 2700 students. When the new wing opens up in 2007 we anticipate a student enrollment of 2200. Our middle and elementary schools are also approaching their rated capacity.

The consideration of Middletown School District's concerns and circumstances as you move through your planning process would be greatly appreciated. We would also like to ask if the Town of Wallkill Planning Board would be willing to assign one of your members to act as a liaison with the Middletown School District regarding these matters so that we might formalize and increase the cooperation between our two public entities.

Thank you for your consideration and time.

Sincerely,

Edwin A. Estrada
EDWIN A. ESTRADA
Enlarged City School District of Middletown Board of Education



Town of Wallkill

600 Route 211 East • P.O. Box 398 • Middletown, New York 10940

Commission for Conservation of the Environment

Claude Brathwaite · Kate Fox · JonPaul Heurich · Sal LaBruna · Michael Leary · Patricia Owen · Kevin Sumner

May 2, 2005

To: Planning Board of the Town of Wallkill
600 Route 211 East
P.O. Box 398
Middletown, NY 10940

Re: The Final Environmental Impact Statement for the "Golden Triangle" project

General Comments:

The observations contained in this document should be considered additions and updates to the comments we submitted in October of 2004 on this project's Draft Environmental Impact Statement.

Findings:

After studying the Final Environmental Impact Statement for the Golden Triangle project, the Town of Wallkill Commission for Conservation of the Environment has found the following:

*Comment
6-7*

1. **Community Services:** A number of local officials have questioned the estimated number of school-age children that the proposed residential portion of the project would add to the Middletown City School District. The project sponsor has utilized a demographic multiplier for this type of land use that was developed by the Urban Land Institute. According to the ULI Web site, the membership of this organization consists of "leading property owners, investors, advisers, developers, architects, lawyers, lenders, planners, regulators, contractors, engineers, university professors, librarians, students and interns."¹ This description does not indicate that ULI is a balanced, unbiased source for obtaining critical data. In Response 6-3 of the FEIS, the applicant has appropriately sought to compare their estimate to the actual numbers of students that similar projects have yielded to assuage the concerns of town and school officials. However, none of the developments listed for comparison are in the Town of Wallkill. Furthermore, they are all located in municipalities that are along or very near the New York State Thruway, a difference that might produce a substantial variation in the demographic and social characteristics of these types of developments.

¹ http://www.uli.org/Content/NavigationMenu/AboutULI/WhoWeAre2/About_ULI_Who_We_Ar.htm

Comment
5-11

Traffic: The data used in the traffic study for this project was obtained during the months of January, March and April of 2003. We believe it is reasonable to assume that there is significantly less traffic on the road during the winter months, compared with traffic levels typical of the summer and holiday seasons. Consequently, we are concerned that this traffic study may not represent an accurate prediction of future traffic conditions.

3-3

3. **Stormwater Runoff:** In response to our previous comments, the applicant has included pollutant-loading calculations for stormwater discharges in an appendix to the FEIS. The project sponsor also reports that the stormwater management practices chosen for this site will result in a 59% reduction in total suspended solids (TSS) and a 66% reduction of total dissolved solids (TDS). The document does not clearly state if this represents a reduction from the developed site without stormwater controls, or compared to existing undeveloped conditions. If the reduction were based solely on the use of stormwater management practices, this would still represent an overall increase from existing conditions and should be clearly indicated. If the developed site with controls will result in a reduction compared to the undeveloped site, this calls for a detailed explanation. Furthermore, there is no discussion of the significant increase in both nitrogen (TN) and phosphorous (TP) levels in the effluent. The amount of TN will increase from 59.86 to 139.79 (no units specified, but we believe this is pounds annually). The amount of TP will increase from 3.70 to 9.78. On a percentage basis this appears to be a substantial upsurge. These two substances are strongly linked to the growth of algae blooms in many bodies of water, and in this case may represent a potential risk to Silver Lake.² The effect of this project viewed in isolation might not be significant, but the cumulative effects of this and other pending projects in the Silver Lake watershed, including some that may not have been required to comply with new stormwater regulations, are a serious concern.

2-13

4. **Commercial Development:** Although we have a few issues with Phase I of this project, at this time our primary concern with the Final Environmental Impact Statement for the Golden Triangle project is the limited amount of information available on the second development phase. The environmental impact of the commercial development is essentially limited to a statement in the second paragraph of the introduction which states, "Full build out of the project site, which is addressed generically in the DEIS because critical details are not yet known, would include a variety of commercial uses consisting of retail, office, hotel, restaurant and other related uses on approximately 74 acres of land." The proposed commercial phase of this project will expand an already existing corridor of sprawling commercial development into an area that is primarily residential, currently undergoing alarming growth, and already facing traffic issues. Massive chain stores, hotels and restaurants surrounded by acres of parking are traits often associated with auto-oriented development that is commonly referred to as sprawl.

² Blue-green algae are microscopic organisms found naturally in lakes, ponds, and streams. Under certain conditions, special characteristics of blue-green algae allow them to multiply faster than other types of algae and this rapid growth is called an algae bloom. Some types of blue-green algae produce toxins that are harmful to people and animals. [See appendix]

Recommendations:

The Town of Wallkill Commission for Conservation of the Environment recommends that the Planning Board and applicant consider the following recommendations and suggestions for the proposed Golden Triangle project:

- Comment 6-7*
1. **Community Services:** In regard to the effect on schools, the applicant should attempt to locate similar projects within the Town of Wallkill and provide the actual numbers of school-age children currently living in those developments. Additionally, they should consider finding an alternative method of calculating the number of potential students. In our view, a formula, method or multiplier developed by a public advocacy or government sponsored organization would have more credibility than the above-mentioned multiplier based on the Urban Land Institute's handbook. We believe an investigation on this issue would give the Planning Board a more complete assessment.³

 2. **Traffic:** The applicant should consult the NYSDOT publication entitled *Guidelines for Preparing Traffic Impact Studies*, and any other relevant documents to consider the implications of gathering traffic data during certain months of the year. Additionally or alternatively, the Planning Board may wish to briefly consult with a Traffic Engineer to discuss how the timing of data collection might affect the accuracy of the traffic study.

 3. **Stormwater Runoff:** The applicant should study the potential threat posed by increased levels of both nitrogen and phosphorous in the effluent, specifically whether the amounts indicated in the pollutant-loading calculations could lead to the formation of toxic algae blooms in Silver Lake. The FEIS should also clearly explain how and why the TSS and TDS would differ from existing conditions.

 4. **Commercial Development:** The Conservation Commission would like the applicant to consider a number of different options for the final development phase of the site. The project sponsor has the opportunity to create a more community friendly development by taking advantage of compact building design, using smaller set-backs, locating shared parking behind buildings, and expanding a network of internal sidewalks and crosswalks. The Master Plan Review Committee is currently debating the creation of "Town Center" zoning surrounding the new Town Hall government complex which would utilize some of these principles. This area, labeled "The Mills Industrial Park" in the FEIS, is located directly across Route 17 from the Golden Triangle site and also features a Route 211-Silver Lake Scotchtown connector road (Tower Drive), like the one proposed for this project. The Golden Triangle might benefit from a similar development scheme. When this project returns to the Planning Board for site plan approvals for the second development phase, we would like the applicant to submit any preliminary sketches to the Conservation Commission in an effort to work together with this organization, the Planning Board, and the Town Engineer to create a better project for the applicant and the community.

³ See Mr. Dulgarian and Mr. Brodsky's comments in the minutes of the public hearing: *Matter of the Application of Golden Triangle, SP/SUP & DEIS: Public Hearing* (October 20, 2004), p. 40-41

We would like to thank the Planning Board for allowing us the opportunity to evaluate this proposed project and submit our comments. We also appreciate the applicant's patience and willingness to consider these comments and recommendations.

Sincerely,

A handwritten signature in cursive script, appearing to read "Salvatore J. LaBruna", with a long horizontal flourish extending to the right.

Salvatore J. LaBruna
Chairman
Town of Wallkill
Conservation Commission

CC: Town Board of the Town of Wallkill
Town of Wallkill Master Plan Review Committee

APPENDIX

New York State Department of Health, *Information Bulletin: Blue-green Algae* (2003)

Blue-green Algae

These questions and answers provide information to address health concerns about exposure to blue-green algal toxins in **surface waters** (lakes, rivers, streams and reservoirs).

What are blue-green algae?

Blue-green algae, technically known as **cyanobacteria**, are microscopic organisms that are naturally present in lakes and streams. They usually are present in low numbers. Blue-green algae can become very abundant in warm, shallow, undisturbed surface water that receives a lot of sunlight. When this occurs, they can form blooms that discolor the water or produce floating rafts or scums on the surface of the water.

What are the potential health effects from drinking or coming in contact with water containing blue-green algae?

Some blue-green algae produce toxins that could pose a health risk to people and animals when they are exposed to them in large enough quantities. Health effects could occur when surface scums or water containing high levels of blue-green algal toxins are swallowed, through contact with the skin or when airborne droplets containing toxins are inhaled while swimming, bathing or showering.

Consuming water containing high levels of blue-green algal toxins has been associated with effects on the liver and on the nervous system in laboratory animals, pets, livestock and people. Livestock and pet deaths have occurred when animals consumed very large amounts of accumulated algal scum from along shorelines.

Direct contact or breathing airborne droplets containing high levels of blue-green algal toxins during swimming or showering can cause irritation of the skin, eyes, nose and throat and inflammation in the respiratory tract.



Surface water affected by blue-green algae often is so strongly colored that it can develop a paint-like appearance.



Under some environmental conditions, blue-green algae can become so abundant that they form floating rafts or scums on the surface of the water.

Recreational contact, such as swimming, and household contact, such as bathing or showering, with water not visibly affected by a blue-green algae bloom is not expected to cause health effects. However, some individuals could be especially sensitive to even low levels of algal toxins and might experience mild symptoms such as skin, eye or throat irritation or allergic reactions.

There is less information available about the potential health effects of long-term exposure to low levels of blue-green algal toxins. Some limited evidence from human studies suggests that long-term consumption of untreated surface waters containing high levels of blue-green algal toxins could be associated with an increased risk of liver cancer. However, people in these studies also were exposed to other factors associated with liver cancer. As a result, it is unknown whether algal toxin exposure contributed to this risk.

Long-term, continuous exposure to algal toxins in the Northeast is unlikely, because blue-green algal blooms are likely to occur only during the hottest part of the summer. New York State public water supplies that use surface water sources also have operational controls to minimize the introduction of blue-green algae in drinking water.

How do I know if I am being exposed to blue-green algae?

People should suspect that blue-green algae could be present in water that is visibly discolored or that has surface scums. Colors can include shades of green, blue-green, yellow, brown or red. Water affected by blue-green algal blooms often is so strongly colored that it can develop a paint-like appearance.

Unpleasant tastes or odors are not reliable indicators of blue-green algal toxins or other toxic substances, because species producing blue-green algal toxins may or may not also produce chemicals that affect the taste or odor of drinking water. Similarly, the absence of unpleasant tastes and odors does not guarantee the absence of blue-green algal toxins.

Avoiding exposure to blue-green algae

Never drink untreated surface water, whether or not algae blooms are present. Untreated surface water may contain other bacteria, parasites or viruses, as well as algal toxins, that all could cause illness if consumed.

People not on public water supplies should not drink surface water, even if it is treated, during an algal bloom because in-home treatments such as boiling and disinfecting water with chlorine or UV and water filtration units do not protect people from blue-green algal toxins.

If washing dishes in untreated surface water is unavoidable, rinsing with bottled water may reduce possible residues. While we don't know if water containing low levels of blue-green algal toxins could leave residues on dishes, taking this precaution may help reduce possible exposures.

People, pets and livestock should avoid contact with water that is discolored or has scums on the surface. Colors can include shades of green, blue-green, yellow, brown or red. If contact does occur, wash with soap and water or rinse thoroughly with clean water to remove algae.

Stop using the water and seek medical attention if needed if symptoms such as skin, eye or throat irritation, allergic reactions or breathing difficulties occur while in contact with untreated surface waters. However, swimming, bathing or showering with water not visibly affected by a blue-green algae bloom is not expected to cause health effects.

Where to get more information

NYS Department of Health
Bureau of Toxic Substance Assessment
ph: 800-458-1158 ext. 2-7820



NYS Department of Health
Center for Environmental Health
547 River Street, Troy, NY 12180

Appendix C
Public Hearing Transcripts

PLANNING BOARD: TOWN OF WALLKILL
MIDDLETOWN, NEW YORK

-----X

Matter of the Application of:

GOLDEN TRIANGLE

SP/SUP & DEIS

Public Hearing

-----X

Town Hall
Middletown, New York
September 15, 2004

B e f o r e:

GARY LAKE

Chairman

DOUG DULGARIAN
PATRICK OWEN
RALPH CARR
WILLIAM CAPOZELLA
GERALD LUENZMANN

RICHARD MCGOEY
DAVID BRODSKY, ESQ.
MARYLYNN HUNT

Engineer
Board Attorney
Secretary

Robert J. Cummings, Jr. RPR
Court Reporter

ucida 12

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2 CHAIRMAN LAKE: We have 3 public hearings.
3 If you would like to speak, we will call your name
4 at the time of that public hearing.

5 The first public hearing is Golden Triangle.
6 We will take your comments, it's not a debate on
7 this, this is just for the DEIS. There will be
8 more public hearings after this, but for tonight,
9 that's where we are at.

10 I will have Mary Lynn read the legal notice
11 as it appears in the paper.

12 THE SECRETARY: "Town of Wallkill, Planning
13 Board Notice of Public Hearing. Notice is hereby
14 given that a public hearing of the Planning Board
15 of the Town of Wallkill, Orange County, New York
16 will be held at the Town Hall at 600 Route 211
17 East on the 15th day of September 2004 at 7:30
18 p.m. or as soon thereafter as the matter can be
19 heard that day on the application of Golden
20 Triangle Developers LLC for approvals for
21 subdivision and approval for site plan and a
22 special use permit of the Phase I of the Golden
23 Triangle development. The applicant proposes to
24 develop 95 townhome residences on approximately
25 18.98 acres of the site in Phase I. The project

1
2 site is located south of silverlake Scotchtown
3 Road, west of New York State Route 17 and north of
4 New York State Route 211 in the Town of wallkill,
5 Orange County, New York, and is designated as the
6 Town of wallkill tax map numbers 40-1-16,
7 40-1-35, 41-1-45 and 50-162. This matter is
8 pursuant to sections 249-38 and 249-40 of the
9 Zoning Law of the Town of wallkill. All parties
10 of interest will be heard at said time and place".

11 CHAIRMAN LAKE: Thank you.

12 Okay, name for the record, please?

13 MR. WELLS: My name is Frederick wells from
14 Tim Miller Associates.

15 CHAIRMAN LAKE: Do you have your mailings.

16 MR. WELLS: Yes, I do. Affidavit of
17 publication and the return receipts.

18 CHAIRMAN LAKE: Okay. Will you please give a
19 description of the project?

20 MR. WELLS: Tim Miller Associates is the
21 environmental consultant for this project and the
22 project plans were developed along with Lanc &
23 Tully Engineers.

24 what I have here are three boards - one is an
25 aerial photograph of the general area to orient

1
2 people and I have a couple of copies of the plan.

3 The project site is what's darkened in here,
4 the dark black line, north is up. This is Route
5 17. This is Route 211 (indicating). So the site
6 borders on Route 211, Route 17, Silverlake
7 Scotchtown Road is here and this is a railroad
8 right-of-way on the westside.

9 The general area that was developed and
10 discussed in the EIS was generally what you see
11 here, particularly the traffic study, which
12 studied area intersections in the general vicinity
13 that's shown on this aerial photograph.

14 The Draft Environmental Impact Statement was
15 the document prepared for the Planning Board and
16 public review, which analyzes environmental
17 impacts of the potential proposed project. This
18 environmental impact statement was actually two in
19 one - it was what's called a Generic Environmental
20 Impact Statement for this overall what we call
21 master plan, which is the entire parcel, which
22 includes the residential portion in one corner and
23 commercial mixed commercial uses in the rest of
24 the property. This graphic north is to the left.

25 Also, in the DEIS a site specific analysis

1
2 was done for the Phase I residential portion,
3 which is this portion. We will discuss that a
4 little bit further.

5 I just want to familiarize the public with
6 the general process the environmental impact
7 statement has been accepted and circulated by the
8 Planning Board as lead agency. It was circulated
9 to other approving agencies, and then this hearing
10 is held to receive comments. After the comment
11 period there is a period of written comments that
12 are received.

13 A Final EIS will be prepared by the applicant
14 which responds to comments received by this Board
15 and that Final EIS will also need to be accepted
16 by the Planning Board and circulated as well
17 before any further action is taken. No actions
18 can be taken on this project prior to a findings
19 statement, which concludes the environmental
20 review process, a findings statement that outlines
21 all the issues discussed, and the impacts and
22 mitigation proposed in the project.

23 Lorraine Potter is here to talk about Phase
24 I.

25 MS. POTTER: Phase I of the project we are

1
2 proposing 96 individual townhouses under
3 condominium ownership. There will be a
4 homeowner's association associated with this.
5 The entrance will be off of Scotchtown Silverlake
6 Road looping through the site and coming back out
7 on Scotchtown Silverlake Road here (indicating).

8 The site will be served by municipal water
9 and sewer.

10 The roads within the site will be private
11 roads maintained by the homeowner's association.

12 There will also be a recreation area
13 associated with the site.

14 There are wetlands around the site which will
15 not be disturbed. They are located in this area
16 and in this area (indicating) and, therefore, it
17 will help give a buffer from Scotchtown Silverlake
18 Road.

19 MR. WELLS: Generally, a couple of numbers I
20 want to throw out that I neglected to mention.
21 The entire site is almost 93 acres. This parcel
22 is 19, approximately 19 acres.

23 And the scenario that's shown in the master
24 plan is what is considered a maximum build out
25 plan for the purposes of the environmental

1
2 assessment. So what's shown here is potentially
3 maximum development of the parcel.

4 And one point a major portion of this, a
5 major component of this proposal is a through road
6 which would be a Town road between Silverlake
7 Scotchtown Road and Route 211, including an on/off
8 ramp to Route 17 as integral to the project. And
9 the applicant has presented that in the EIS as an
10 integral part of this project for the full build
11 out scenario.

12 And also in the Environmental Impact
13 Statement traffic study was significant amount of
14 off-site traffic analysis, and the EIS presents
15 mitigation off-site that are being proposed both
16 as part of Phase I and potentially as part of the
17 full development scenario. Once there is approval
18 for those projects off-site mitigation will be
19 conducted.

20 We are prepared to listen to comments from
21 the public and the Board. We will answer
22 questions, if the Board wishes us to, or we are
23 here to receive comments.

24 CHAIRMAN LAKE: With due respect, it's not a
25 debate, so, we will take the comments. They can

1
2 enter it into the DEIS and then we will make
3 decisions on what questions, if any, and go from
4 there.

5 Let me go through the Board, Doug?

6 MR. DULGARIAN: Not at this time.

7 CHAIRMAN LAKE: Patrick?

8 MR. OWEN: After the public.

9 CHAIRMAN LAKE: Ralph?

10 MR. CARR: I will wait, after the public.

11 CHAIRMAN LAKE: Gerry?

12 MR. LUENZMANN: After the public.

13 MR. CAPOZELLA: After the public.

14 CHAIRMAN LAKE: I will open the public at
15 7:45. Before I go to the public I'll have
16 MaryLynn read in a small letter that the
17 Silverlake Fire District handed in tonight.

18 THE SECRETARY: "To Whom it May Concern:
19 After further review of the proposed Golden
20 Triangle project, it has become apparent that
21 this project will greatly impact the Silver Lake
22 Fire Department.

23 "Some facts that I would like to discuss is
24 the fact that our department is 100% volunteer.
25 We currently operate out of an out-dated

1
2 firehouse, of which we have out-grown. We also
3 currently operate a 1990 ladder, which is due for
4 replacement.

5 "Our department currently operates with
6 approximately 35 active volunteer firefighters.
7 In the 1980's our department operated with 50
8 active volunteers. Every year this number has
9 dwindled at an alarming rate. As the current EIS
10 report it is stated that quote, based on published
11 standards approximately 2.3 firefighters would be
12 needed, unquote. If the fire district were to
13 hire two paid firefighters, it would cost the
14 district approximately \$140,000 per year.

15 "Our present firehouse was built in 1964.
16 The current size of this house will not outfit
17 newly designed fire trucks due to changes in the
18 NFPA standards for safety and enhancement
19 features.

20 "Also due to a heavier amount of required
21 reports and files, our current office space has
22 become extremely too small for our department's
23 needs. Our district is presently researching the
24 possibilities of building a new firehouse which is
25 an estimated cost of 6 million. Our current

1
2 working budget is \$500,000 per year. This project
3 is expected to be 100% bonded.

4 "Our department currently operates two
5 engines, one ladder truck, one heavy rescue truck
6 and two utility vehicles. Our 1990 ladder truck
7 is due for replacement. A new ladder truck will
8 cost approximately \$700,000 to 900,000.

9 "In closing, the current EIS report states
10 that quote tax revenue generated by the proposed
11 developments would offset costs associated with
12 cumulative development, unquote. I feel that the
13 facts stated above clearly show that in order for
14 your development to be protected to the highest
15 standard, our department must make some costly
16 changes.

17 "At this time we would like to request some
18 additional time to further review this EIS report.
19 We would enjoy sitting down and discussing this
20 situation further with you. Please feel free to
21 contact me directly. Sincerely, Jeff Jakes,
22 Chief of the Department".

23 CHAIRMAN LAKE: We will enter that into
24 record and make sure you receive a copy of that
25 letter.

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At this time I open the public hearing to the public. When you please come up, please speak clearly. We want to get your comments into the record and into any other documents that are going to be produced from this hearing tonight.

First one?

THE SECRETARY: Pat Owen.

CHAIRMAN LAKE: Just your name, please.

MRS. OWEN: Patricia E. Owen.

CHAIRMAN LAKE: Okay, thank you.

MRS. OWEN: I am a member of the newly formed Conservation Committee Board. And we feel, we were just notified about this. We need a lot more time to study the impacts of it.

*Comment
2-1*

We have a problem of traffic flow. I mean the traffic, I go through there occasionally - it's heavy. Now, we have to think about when the commuters come through because, obviously, I am not going there.

Now, there is a new development around Tower Drive and the traffic there is bad. We need time for this development to settle down, settle in, before we think about building anything else.

And with the schools, where are we going to

1
2 put all of these children? We are overcrowding
3 now in the Middletown School system. It's going
4 to put a hardship on all of the people if they
5 have to put up another school for taxes. They are
6 very high now.

7 The roads, the roads can't handle the
8 traffic - they are not wide enough. They are too
9 busy now.

10 The wetlands, that's something else I would
11 like to study further on my own, the impact on the
12 wetlands we have with the roads, the run-off from
13 them and the buildings going into the running
14 water, there is running water there, that's
15 something to consider with the environment.

16 Nobody really knew about this, hardly
17 anybody, no one I know, until we read it in the
18 paper today. And I think the public needs a
19 little more time to study this, as well as our
20 Board.

21 I think we ought to have maybe the public
22 comment on it for about 30 days where they could
23 write in and state how they feel about it because
24 we have to consider the people living here.

25 And I am not good at public speaking like

*Comment
2-1*

1
2 this, so I am going to leave it to some of the
3 other people who are vocal and elegant in what
4 they say. But please to consider what I have
5 said.

6 Thank you.

7 THE SECRETARY: Eric Valentin.

8 CHAIRMAN LAKE: Good evening.

9 MR. VALENTIN: Good evening. Eric Valentin.

10 I want to thank the Silverlake firehouse for
11 their comments and their deep concern and their
12 very good points on this matter.

13 I have a couple of concerns. They said that
14 it was going to come off of Silverlake Scotchtown
15 Road. I don't know what their impact studies have
16 shown, but I live in that area and I know that
17 currently we have a problem with Silverlake
18 Scotchtown Road, and there is a project off Tower
19 Drive, apartments that are going up that they are
20 not finished, and it's truly going to add more
21 traffic to that road, Tower Drive and Silverlake
22 Road. Silverlake is a single road on both sides
23 and you just can't -- you are talking about 90
24 homes, on the average each home has two cars -
25 that's 180 plus more cars on that road. And I am

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comment
5-1

sure it's going to be more than 180 cars.

So, I don't know at what time -- I would like to know what time they did the traffic study, is it current? Is it taking into consideration the already approved projects for that area? And already being built projects for that area?

I know that Stewarts has problems getting in and out of their parking lot and getting onto Silverlake Scotchtown Road.

So, to say that this project would not impact that area is, in my opinion, is false because I truly believe it's going to impact greatly in my area.

comment
2-2



This may not hold any ground, but I know that back in 1989 when they discussed this project, they had a resolution was passed. And in that resolution it stated that the developer had one year to make an application for special use permit and preliminary approval to the Planning Board. I don't know if they did that. I don't know if the changes that we have put in place in zoning affect that, but I would like that for you guys to look into that.

I would also request that this public hearing

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be held open. I spoke to some of the residents in
3 that area and I know that he submitted papers
4 where he did mail, but either they didn't get a
5 chance to come out here today, or some of them
6 said that they didn't get the notice. Sometimes
7 things get lost or they never see it in the mail,
8 but I would like to request from the Planning
9 Board that this stay open.

10

I think that's about it. It's the first
11 phase, I believe, is going to impact that whole
12 area greatly and the second phase is a nightmare.

13

Thank you.

14

CHAIRMAN LAKE: Thank you.

15

THE SECRETARY: Nina ^{Guenste}~~Gadstein~~.

16

CHAIRMAN LAKE: Are you speaking for both at

17

this time or just --

18

^{Guenste}
MS. ~~GADSTEIN~~: No, someone else is going to

19

speak for the other.

20

CHAIRMAN LAKE: Oh, I didn't know.

21

^{Guenste}
MS. ~~GADSTEIN~~: Yeah, I didn't want to make it

22

confusing.

23

^{Guenste}
Nina ~~Gadstein~~, Town of Wallkill.

24

I have a few questions on the DEIS. On the

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project overview they state the project is located

Comment
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Comment
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near the major commercial residential centers of the Town and as such is suitable for a similar type and intensity of development.

If you look at the map, it is not near those areas. The only area that is near them is a very very small portion of 211.

Comment
4-1



They are talking that this site will have to be totally, you know, graded and all natural habitat will be gone from the area. I don't know what research they did.

They also state the extent of wetland disturbance and wetland compensation that would accompany the full built plan is not known at this time.

They don't show the stream that runs into Silver Lake on their plans for their development. I don't know if they have taken it into effect, but I have looked at the maps in the DEIS and it's not located on any of the maps there. And this is a major stream that runs through the area and through the property. And if you are talking about taking away the wetlands, you know, and covering the majority of that site with cement, I can't see how it cannot have an impact, and a

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comment
4-1



negative impact.

Water run-off that goes into the ground, you know, where is it going to go; is it going to go down to the stream and then into the water to Silver Lake?

comment
2-4



what they also don't discuss in the DEIS is the air and noise pollution that will happen with Phase II to the residents of Phase I. Okay?

There is a town in New Jersey, Montvale, New Jersey, where they built very lovely homes. They took down woods for \$6, \$700,000 homes. They put in 287, took down all the woods. When you sit in the backyards of these lovely homes, all you hear is the traffic and the trucks because the trees are no longer there to cushion it. That needs to be taken into effect.

Are these people going to move into these townhomes thinking they have lovely woods behind them, and all of a sudden there is a commercial development sitting in the backyard.

comment
4-2

The air, like I said, and the noise, will also travel down to the residences in that area.

You know, they say in the DEIS, again, like I said, the loss of upland habitat is unavoidable,

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Comment
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but they are going to use trees and landscape buffers. Some of the trees on that property are probably 75 feet tall, if not taller, and that takes a long time for them to grow back.

I am not going to go over everything now.

CHAIRMAN LAKE: That's okay.

MS. ^{Guenste}GADSTEIN: You know, again, in their site

Comment
5-2
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area description they refer to Route 211, you know, Route 211 is not near that site - it has a very small portion.

And when I talk to the DOT they talk about removing different entrances and exits off of 211. So, instead of having traffic congestion on Tower Drive, we are going to move it across town to the other end of Tower Drive, so the people that use to go from different areas on 211 from both directions, are now going to be funneled into this one area.

You have got, like Eric was stating, not only do you have 198 apartments have been approved, you also have Kabro with 256 units right up Mud Mills Road. So you are talking heavy traffic congestion that really needs to be looked at.

Comment
5-2



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2 I have sat at Tower and Scotchtown Road for 5
3 minutes waiting to get out at 3:00 in the
4 afternoon, and that's not morning rush-hour.

5 So, I really feel the DEIS is lacking in
6 looking at the overall impact of clearing close to
7 90 acres of trees in an area, disturbance of
8 wetlands, traffic, air, and other pollution.

9 Thank you.

10 CHAIRMAN LAKE: Thank you. Do you want to
11 submit that in written form? You did give us
12 quite a bit right there.

13 MS. ^{Guenste}GADSTEIN: No, these were like just my
14 little notes.

15 CHAIRMAN LAKE: There is a written comment
16 period.

17 MS. ^{Guenste}GADSTEIN: I can write it out, yeah.

18 CHAIRMAN LAKE: I think it would be helpful,
19 even though we did get it on tape and he's taking
20 it, but it would be helpful coming from you.

21 MS. ^{Guenste}GADSTEIN: Sure.

22 CHAIRMAN LAKE: The only comment I would
23 make - Tower Drive is not going away. I don't
24 want people to think that's going to disappear.

25 MS. GADSTEIN: Oh, no, I just meant the

1
2 traffic in different directions would be affected
3 on Tower Drive, rather than going down towards 211
4 at that end near Galleria, it would be coming in
5 this direction.

6 CHAIRMAN LAKE: I didn't want people to think
7 Tower Drive is going to go away, because it's not.

8 MS. ^{Guenette} GADSTEIN: Okay, thank you.

9 CHAIRMAN LAKE: Okay, next?

10 THE SECRETARY: Conservation Committee.

11 CHAIRMAN LAKE: Your name for the record?

12 MR. LABRUNA: Salvatore LaBruna. I am also a
13 member of the Conservation Commission.

14 This is a written letter from the Commission
15 requesting the public hearing remain open for 30
16 days for comment. If I could read through this
17 briefly. I know other members of the commission
18 have spoke and I'll give other people a chance.

19 CHAIRMAN LAKE: Speak up a little bit.

20 MR. LABRUNA: Okay. "Dear Chairman and
21 members of the Planning Board, the Conservation
22 Commission of the Town of Wallkill has taken a
23 look at executive summary of the DEIS submitted by
24 Golden Triangle development. The members are
25 concerned regarding impact on various areas such

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2 as lake pollution, storm water run-off, affect on
3 the stream that runs through the property, the
4 grading of the entire site, air pollution, and
5 noise impacts. The project of this scale requires
6 careful consideration. All parties would benefit
7 from a thorough review of the DEIS and the
8 potential impacts on the town residents.

9 Therefore, the Town of Wallkill Conservation
10 Commission respectfully requests that the public
11 hearing not be closed this evening, but be left
12 open for 30 days to allow them to review the
13 entire DEIS and investigate the areas of concern
14 in a complete and thorough manner".

15 I will submit that.

16 CHAIRMAN LAKE: Do you want to submit that?

17 MR. LaBRUNA: Yes, thanks.

18 CHAIRMAN LAKE: Thank you. Anybody else?

19 Anyone else at this time wish to speak on
20 this project?

21 Name for the record, please.

22 MR. ESTRADA: Ed Estrada, Town of Wallkill.
23 I live over on Walsh Lane in the Town of Wallkill,
24 right behind going the Tower Ridge development.
25 But actually I am here on behalf of the school

1
2 board for the Enlarged City School District of
3 Middletown, of which I serve as a board member.

4 Our concerns from the Board are that
5 eventually we are going to need to take some sort
6 of deep breath and try to calculate the number of
7 developments that are coming into the Town and
8 what impact it's going to have on the school
9 district.

10 The school district is in the process of
11 sending to the State Education Department its
12 plans in regards to a 34 million dollar
13 renovation project to the high school in
14 Middletown, of which this particular development
15 falls under, as well as the Tower Ridge apartments
16 also fall under. And now we are beginning to
17 second guess ourselves as to whether or not that
18 renovation project is sufficient enough to handle
19 the influx of students from each of the
20 developments that are being contemplated by the
21 Planning Board.

22 It's interesting to hear the letter from the
23 Silverlake Fire District, I am sure the police
24 department as well has concerns as far as man
25 power with regards to the additional population,

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2 especially in this particular area, which I am
3 sure is a priority growth area, which is set forth
4 by the master plan of Orange County. Unfortu-
5 nately, priority growth area doesn't mean it all
6 has to be done at the same time.

7 So, what I would suggest, one, is if the
8 public hearing can also be extended for 30 days,
9 as many of our Board members just found out about
10 it through the newspaper this morning.

11 And in addition to that, that the Planning
12 Board really take a look, not just at this plan as
13 one individual plan being recommended, but as a
14 whole, to try to figure out what impact the Tower
15 Ridge development, which is in excess of 150
16 units, will have on the infrastructure of that
17 particular area, the fire district, the police
18 department, and the city school district.

19 Based on the assessments that were brought
20 down by the Office of Real Property, Town of
21 wallkill residents are facing via the increase of
22 a 6% school budget, a 22% increase in taxes. And
23 that has to be taken into consideration because
24 long term impact on our residents here is
25 overwhelming, and we were at our wits end.

Comment

6-2



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2 I would like to extend an invitation to the
3 Planning Board or if you guys can send us a letter
4 or maybe we can sit down with the school board,
5 representatives of the school board and the
6 Planning Board, and so we can kind of plan out
7 some of the growth that's projected in the Town of
8 Wallkill, or the Enlarged City School District of
9 Middletown. I am sure that our neighboring
10 districts in Pine Bush and Minisink and Goshen
11 and Valley Central are probably thinking the same
12 thing. Although in this particular area, our
13 concern right now is the influx of students to
14 each of our respective schools based on the two
15 developments, not as one individual development,
16 but as a whole, and that's kind of what we have to
17 look at.

18 So, thank you very much.

19 CHAIRMAN LAKE: Just one moment, you are 100%
20 right. For years we have sent things to the
21 Middletown school board, Goshen school board,
22 Valley Central, Pine Bush, and I forget the other
23 one now, but anyway, I have also spoke to people
24 from the Middletown school board exactly what you
25 just said. I think the first contact I have had,

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2 probably a year and a half ago, the second contact
3 was about a year ago. So, there has been a little
4 effort for us to try to do exactly what you said.
5 I think this Board welcomes that. I think that is
6 something that we discussed many many many times,
7 and I am sure Mr. Dulgarian is going to bring that
8 up in a second. But the effort has been made. I
9 am glad to see that you are hear here tonight.
10 Like I said, I have personally have spoken to two
11 Board members, I don't know if they are on the
12 Board yet or not.

13 MR. ESTRADA: William Geiger is the
14 representative now from the Town of Wallkill. He
15 couldn't be here this evening. I thank you,
16 though. We sat down with the Common Council of
17 the City of Middletown on Monday evening to
18 discuss sitting down with their city assessor
19 during school budget time to try to figure out
20 what the tax levy will be in the future, and maybe
21 we could do that same thing with the Town of
22 wallkill and also with the Planning Board as well.

23 CHAIRMAN LAKE: I think that would be a good
24 idea.

25 MR. ESTRADA: Great. Thanks.

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MR. DULGARIAN: Just one second. Mr. Estrada

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MR. ESTRADA: Yes.

MR. DULGARIAN: I will echo what Chairman Lake said, that it's nice to have somebody from the school board here representing them.

I too have been in contact with them over the years dating back 5 or 6 years ago, with very little response. It's hard to believe that the projects that we look at, we are not allowed to look at the impact on schools, the impact on fire districts because we are not experts in that field, so, we welcome all of that input.

comment
b-3



Now that you are here, I have a question for you: In this DEIS on page 3.8-2 they talk about the 90 units, and I just want your professional opinion on this, or maybe you could check it out. It says, "The proposed project will increase the need for school services, including bus transportation for the additional 23 school aged children expected to attend public schools".

Now, they base that on a development impact assessment handbook that was published by the Urban Land Institute in 1994 which states that,

Comment 6-3

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"This type of development will have .02552 school aged children per unit". That doesn't sound right to me, I am not an expert in that. But if you could provide us figures on what you think it would actually be, I would like to see that, because I don't agree with this.

MR. ESTRADA: That would be fantastic because I don't agree with it either. Some of those assessments I call our best laid plans. You have certain development and a certain type of client that you want to actually purchase townhouses and homes just like you to with 148 units of an apartment complex, which the answer to me with regard to the Tower Ridge development was that those were high end apartments which aimed toward single professionals. Well, the problem is when that market doesn't develop, for whatever reasons, the developer is not going to sit back and not rent out apartments - they have to do that. So, sometimes the best intentions are there, but it doesn't turn out that way. And then instead of turning into apartments for single professionals, that's when families then come in.

Now, the retail section sometimes, Phase II

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2 that they call here, which maybe you could try to
3 ease some of the tax burden from the residential
4 development if it happens.

5 The problem that a lot of school districts
6 face is that after the planning stages, decisions
7 are made where commercial development, taxes are
8 done as a one lump sum in lieu of annual taxes.
9 That's what happened with some of the retail
10 development that was other things in the City of
11 Middletown that some businesses that were coming
12 in with the same thing. So, the annual tax
13 revenue that you would get from the commercial
14 part of it, actually doesn't materialize on an
15 annual basis - it would be a one lump payment to
16 the school district, and then the rest of the
17 taxpayers are left holding the bag year in year
18 out. And that's a concern down the road.

19 But I agree with you as far as the assessment
20 in regards to student proper population - they are
21 basing it on a study, but it's also, you know,
22 very few times developments actually end up having
23 the type of personnel in there or the type of
24 families.

25 MR. DULGARIAN: well, if you could supply us

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2 with some figures that maybe you folks have come
3 up with, that would be greatly appreciated.

4 MR. ESTRADA: Absolutely.

5 MR. DULGARIAN: Thank you.

6 MR. ESTRADA: Thank you.

7 CHAIRMAN LAKE: Do you want to close the
8 public hearing or leave it open? We have had the
9 requests --

10 MR. DULGARIAN: What are the problems with
11 closing the public hearing?

12 MR. BRODSKY: You can't close it today. It
13 remains open for at least 10 days for written
14 comments.

15 CHAIRMAN LAKE: The written comments for 10
16 days. That I would like to see it extended. The
17 public hearing we can close right now.

18 MR. BRODSKY: Do you have any issues that you
19 want to consider?

20 MR. DULGARIAN: I am wondering what would be
21 the problem with leaving it open? I would rather
22 err to the side of caution, unless there is
23 something that will be affected if we don't close
24 it that I should know about.

25 MR. BRODSKY: If you have a reason for

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keeping it open --

MR. DULGARIAN: My reason for keeping it open would be all the organizations that asked for more time to review that just got the information. And I am just trying to determine for myself if that is a necessity?

MR. BRODSKY: Well, you could keep it open the public comment period for a minimum of 10 days. But the public comment would be in the written form - you wouldn't get the give and take what you have now.

MR. DULGARIAN: Right, they wouldn't be verbally asking and us answer.

MR. BRODSKY: Now is the time that they want to appear before this Board.

MR. DULGARIAN: I kind of like leaving it open if it doesn't hurt anything.

MR. OWEN: If it doesn't hurt anything, I would rather leave it open, just because I think a lot of good could come back from hearing certain comments and be able to ask certain questions in response to those comments. If we get it in written form, we are not going to be able to have access to those people and ask questions.

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2 CHAIRMAN LAKE: If you get it in written
3 form it will be answered just like it would be a
4 verbal comment would be here.

5 MR. OWEN: Right, but I think we are also
6 getting a lot of information from sources --

7 CHAIRMAN LAKE: Then make the motion. I
8 don't know if you want to go through the whole
9 Board. Ralph?

10 MR. CARR: Really I could go either way.
11 Given the size of the project, if, you know, as
12 Doug said to err on the side of caution, that if
13 people want to be heard, that we afford them that
14 choice. For a lot of people, some people
15 mentioned that they had not been notified. We
16 hear that all of the time and, unfortunately,
17 unless you were looking at notices and they are up
18 on this, you get I think it's a 10 day notice and
19 you have to have seen it in the notice and know
20 what it's about.

21 So, if everybody else wanted to go along, I
22 would go along with keeping the public hearing
23 open.

24 CHAIRMAN LAKE: Jerry?

25 MR. LUENZMANN: Yeah, I think we should keep

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2 it open and it's for one very specific reason;
3 this is a major development at a very strategic
4 part of Scotchtown - very heavily traveled. Going
5 to be heavy impact because of traffic and what
6 have you. And I think that just to make sure that
7 all the basis are covered and all the "i's" are
8 dotted you want to keep it open for comment, not
9 written comment, but verbal comment, for another
10 30 days at least.

11 MR. CAPOZELLA: I am clearly in favor of the
12 30 days. I just would heed my warning to the
13 people that came up here and requested the 30 days
14 that if we go forward with this, which we clearly
15 the Board is in favor of it, that we get some
16 feedback and information from the Conservation
17 Committee and so forth. 30 days goes by real
18 fast. Before you know it, it's here. So by
19 putting it off 30 days doesn't necessarily mean
20 anything is going to be accomplished. But, again,
21 we would abide by the 30 days.

22 CHAIRMAN LAKE: Somebody can make the motion
23 then to keep it open. I can go either way.

24 MR. LUENZMANN: So move that we keep it open
25 30 days.

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2 CHAIRMAN LAKE: This project has on a long
3 time. I think they followed the criteria, but if
4 somebody wants to make a motion.

5 MR. LUENZMANN: I made the motion.

6 CHAIRMAN LAKE: Gerry. Second?

7 MR. CAPOZELLA: Second.

8 CHAIRMAN LAKE: Bill. All in favor to leave
9 it open 30 days? We can't do 30 days, we need to
10 go to the next meeting closer to 30 days, which
11 would be October 20th. Okay? October 20th?

12 MR. OWEN: That's fine.

13 CHAIRMAN LAKE: All in favor?

14 MR. DULGARIAN: Aye.

15 MR. OWEN: Aye.

16 MR. CARR: Aye.

17 MR. CAPOZELLA: Aye.

18 MR. LUENZMANN: Aye.

19 CHAIRMAN LAKE: Opposed? None. Okay.
20 David, the written comment can also be
21 extended?

22 MR. BRODSKY: That wouldn't begin to run
23 until you close the public hearing phase, that's
24 correct.

25 CHAIRMAN LAKE: 30 days close it and then

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there is going to be the 10 day comment.

MR. BRODSKY: Another 10 day comment period after that.

CHAIRMAN LAKE: Let me go through the Board. Doug, have you got anything else or wait until you hear from the school district and everybody else?

MR. DULGARIAN: I have got a couple of quick questions.

CHAIRMAN LAKE: Yeah, now is the time to get it in.

*Comment
5-3*

MR. DULGARIAN: Where is Mr. Grealy? Come on down. Couple of quick questions: Silverlake Scotchtown Road intersection with Tower Drive.

MR. GREALY: Correct.

MR. DULGARIAN: On the other intersections you give us an overall intersection grade. On that one you don't.

MR. GREALY: Right.

MR. DULGARIAN: At the end you say "with signalization"; does that mean you are proposing a signal there?

MR. GREALY: Correct. In the mitigation section of the DEIS, we are proposing to install



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Comment 5-3

a traffic signal at Tower Drive and Silverlake
Scotchtown Road; that's why the overall level of
service there is shown with the improvement,
that would be part of our project and that's part
of the Phase I.

MR. DULGARIAN: So, now that, the "C" I am
looking at the end there, that's an average. We
still are going to have the two "F's" above it?

MR. GREALY: Yes, the "F" level of service is
trying to get out of Tower Drive. I think one of
the commenters commented about waiting to exit
from Tower Drive onto Silverlake --

MR. DULGARIAN: With the light it will still
be an "F"?

MR. GREALY: No, with the light the
improvement will be overall improvement of level
"C" because what it does, it allows --

MR. DULGARIAN: Why don't you break that
down? You are showing us 4 different ones and
then you are just averaging it at the end? Or is
that -- maybe I am reading it wrong.

MR. GREALY: I don't know what page you are
looking at, maybe if I could just take a look.

MR. DULGARIAN: If you could explain that to



Comment 5-3

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me if you would be so kind. Are these still going to be "F's", these movements (indicating)?

MR. GREALY: No.

MR. DULGARIAN: What are they going to be then?

MR. GREALY: For the unsignalized intersections, the way that that summary table is shown, it shows the individual movements that are being affected. The "with signalization" summary there, is for the overall intersection level of service "C" and all movements will be "C" or better.

MR. DULGARIAN: All movements. So these "F's" will no longer exist?

MR. GREALY: That's correct.

MR. DULGARIAN: And is that the same for the intersection at Tower and Industrial where we have some "F's" and "E's" there?

MR. GREALY: Tower and Industrial was another location that was identified for signalization. I believe as part of the overall traffic study in the corridor, that's another project is going to do the signal there.

CHAIRMAN LAKE: Listen to me, remember --

MR. DULGARIAN: So that signal will raise



Comment 5-3

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2 that to a "C" also, "C" or better?

3 MR. GREALY: That's correct.

4 CHAIRMAN LAKE: If you remember, to refresh
5 everybody's memory on this, you remember this is
6 part of that whole territory where there is
7 several major --

8 MR. DULGARIAN: Yeah, I got that right here.

9 CHAIRMAN LAKE: -- elements that's
10 contributing different spots to bring these
11 intersections up to a better level.

12 MR. DULGARIAN: That's what I am reading.

13 CHAIRMAN LAKE: Okay, I didn't know you were
14 reading that, okay.

15 MR. DULGARIAN: Yeah, but I wanted to find
16 out if the signalization is in effect at the end
17 of this project, because he's using those figures.

18 MR. GREALY: Well, in terms of what's
19 proposed for this project, the signal at Tower
20 Drive and Silverlake Scotchtown Road, the widening
21 of Silverlake Scotchtown Road to provide a
22 separate left turn into the project and entrance
23 so that through traffic on Silverlake Scotchtown
24 doesn't have to wait when someone is making a left
25 turn into the entrance. And also contributions

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towards the other improvements on a fair share basis.

MR. DULGARIAN: Right, I understand the mitigation. My question is the level of service on the majority of the ones we are looking at are corrected by the signalization and the mitigation?

MR. GREALY: That's, correct.

MR. DULGARIAN: Just one last question while you are here; the other exits, the emergency exit now on the road that may or may not happen, that's just going to be an emergency access for now on Phase I?

MR. GREALY: Yes. This segment here (indicating) is planned to be emergency access only for Phase I.

Comment
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MR. DULGARIAN: So there is only going to be the one in and one out at this point and that's just going to be for emergency vehicles?

MR. GREALY: Correct, that is what the proposal is right now.

MR. DULGARIAN: All right, that's all I have. Thank you. I appreciate it.

CHAIRMAN LAKE: Patrick?

Comment
5-5

MR. OWEN: When does the contribution go into

Comment 5-5

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2 effect, after Phase I or Phase II or a little bit
3 after each?

4 MR. GREALY: After each. Phase 1 has the
5 improvements that I identified, as well as a
6 contribution based on the traffic generation for
7 that phase. So, for example, if Phase II never
8 happened or was delayed for 5 or so years, the
9 contributions for the Phase I portion would have
10 to take place - it's been a condition of any of
11 approvals - as well as the signal at Tower Drive
12 and Silverlake Scotchtown. Then Phase II would
13 have its own mitigation, including the
14 construction of the road, as well as the
15 contribution towards the improvement area, I will
16 call it.

17 MR. OWEN: All right. As Phase II --

18 MR. GREALY: And the concept there is you
19 can't wait until everything is built to make the
20 contribution, you need to make the contribution so
21 the traffic is mitigated up front.

22 MR. OWEN: I just wanted to make sure that's
23 what's going to happen.

24 MR. GREALY: Yes.

25 MR. OWEN: And just so we are clear, if Phase

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II doesn't go through, the ramp never gets built.

MR. GREALY: well, yes, I mean that's part of the Phase II is the whole ramp, the connecting road, and the ramp system, correct.

CHAIRMAN LAKE: Patrick, are you done?

MR. OWEN: I am done.

CHAIRMAN LAKE: Doug?

Comment 2-5

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MR. DULGARIAN: Just maybe not for you, maybe for I guess you are the project leader or whatever, if that road doesn't happen, just to go one step further, are we looking at this 300 townhomes; Alternate Scheme 3?

MR. WELLS: What's presented there as an alternate potential development with the current regs and so forth, and it's studied in the EIS as a potential alternative for you to assess, whether you think that is a better plan versus the master plan versus --

MR. DULGARIAN: Better plan than what?

MR. WELLS: The various alternatives that's presented. It's a matter of comparison, it's not a proposal.

CHAIRMAN LAKE: I thought if you remember --

MR. DULGARIAN: Yeah, I remember. I just

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wanted to mention it, yeah.

MR. MCGOEY: There is language in this document that says this Board will not approve the DEIS for Phase II without the consideration of that exit ramp. You are not, even though --

MR. DULGARIAN: So we are not in the corner.

MR. MCGOEY: Right. You are not in the corner.

MR. DULGARIAN: I am sorry, Gary.

CHAIRMAN LAKE: No, that's all right. That's an important thing to bring out the stand as far as this Board feels on that exit ramp.

Ralph?

MR. CARR: Yeah, I just want to make a comment; if we were looking at this entire project at this time, I will tell you what, given looking at it in terms of storm water run-off, that would be taking down a lot of trees, I will tell you what I would feel a lot more comfortable with it because I really think that if it happened all at once, if we knew it was going to happen like it is here and you have that road in and you had that exit ramp, it would alleviate a lot of congestion in a lot of places in the town from Bert Crawford

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2 to Maltese, down at Wendies on 211 coming from the
3 Galleria to go onto 17 east, Tower Drive, if the
4 whole project were done.

5 Unfortunately, we are looking at Phase I,
6 with the uncertainty that Phase II ever happens.
7 Phase 1 is an intensive use of that piece of
8 property and, unfortunately, all the things that
9 Phase II, in terms of traffic in that area, all
10 the things that Phase II would improve, those
11 problems get exacerbated by Phase I, which is what
12 we end up guaranteed to have.

13 I realize there are mitigations that you are
14 making, and whether we get into whether it's a "C"
15 or not, that's I think what we have to look at -
16 there are a lot of cars, and that's my feeling.

17 Actually, Phase II to me is the plus part of
18 this, unfortunately, there is no way to guarantee
19 that that ever happens. I am just kind of what
20 Doug was saying, if you never got a DOT approval
21 on the exit and forget the -- the option there was
22 an option 2 that's also a commercial development
23 and that still has the road going through to 211.

24 MR. WELLS: That's correct, an alternative.

25 MR. CARR: Which really it's the exit that I

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2 just think it solves a lot of problems there, but
3 unfortunately we are faced with Phase I.

4 MR. GREALY: Just to respond in terms of
5 Phase II, we want the road and the ramps, and we
6 have been working diligently with the Department
7 of Transportations. And just for the public's
8 benefit, we have received conceptual approval.
9 There is a copy of that in the document in the
10 correspondence from the DOT. And we have also
11 gotten favorable feedback from the Federal Highway
12 Administration, although preliminary, because they
13 can't act until this process proceeds.

14 But the Board was very clear last year when
15 we first started this process that we needed to
16 get to that phase to even for the Board to
17 consider it. And we do want that to move forward,
18 and that is a critical part of Phase II.

19 Thank you.

20 MR. CARR: Thank you.

21 CHAIRMAN LAKE: Anything else?

22 MR. CARR: No, thank you.

23 CHAIRMAN LAKE: Gary?

24 MR. LUENZMANN: I think the project,
25 especially following Ralph's comments, Phase I and

Comment
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Phase II, would alleviate a lot of traffic problems that we have right now. But no matter what happens, if it's Phase I or Phase II or both, the choke-point to me is Silverlake Scotchtown Road. And there is nothing that I have seen that's going to mitigate the traffic and the danger that's associated with traversing getting across or driving down Silverlake Scotchtown Road. There is a lot of people, for example, that walk up and down, go to the stores, they go to different stores and there is no sidewalks. It's a speedway. There are houses that get rammed continuously by late night drunk drivers, and I think you have to pay attention to that.

And when you consider not only this project, but all the other projects, and I don't see Silverlake Scotchtown Road being improved, it's a 3 lane, 4 lane, I mean leave right off of Freezer Road and you sit there it seems like 10 minutes, you can't get across, I am talking Freezer Road.

You take a look at all the people walking to the deli, and I think we need a lot more consideration of professionals on what to do with



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Comment 5-6

Silverlake Scotchtown Road. Tower Drive is an abomination right now. Heaven help us what's going to happen when this goes in. A light will not solve the problem. It's going to stagger the problem so you could spit and spurt through the intersection.

But is there going to be a left hand turn lane on Silverlake Scotchtown Road? Or are you just going to sit there for a 3 minute light like you do up on 211 and Tower Drive? I mean, there has got to be more serious consideration on what the traffic flow is going to be through the whole Silverlake Scotchtown Road corridor. There are safety issues, we need sidewalks, and we need yellow lights, we need striping. There is nothing here that's going to make me feel comfortable, unless it's all done.

MR. WELLS: I would just like to mention that part of Phase I proposal is to install sidewalks on the frontage along Silverlake Scotchtown Road.

MR. LUENZMANN: It won't be any good until it's all the way down.

MR. WELLS: Right. We will do our share.

MR. LUENZMANN: It's not all your problem.



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2 But there is an issue there, this is becoming a
3 Route 211 - Silverlake Scotchtown Road is becoming
4 major thoroughfare, very fast drivers. A lot of
5 people who are very dangerous drivers and a lot of
6 people walking that road and heaven help anybody
7 that gets hurt.

8 CHAIRMAN LAKE: Okay, Gerry?

9 MR. LUENZMANN: Yes.

10 CHAIRMAN LAKE: Mr. Capozella?

11 MR. CAPOZELLA: I don't want to beat it to
12 death, but, again, I agree basically with the
13 Board the traffic and a massive project like this,
14 but I think just for myself looking this over,
15 Phase I, Phase II, start looking it over and get a
16 grip on what this is all about - I know we are
17 only talking about Phase I - but you look at the
18 whole thing and I try to figure out in my own mind
19 here how we are going to handle this and how it's
20 going to be taken care of and especially through
21 the Town once it leaves our hands here.

22 At this time I am not really in favor of the
23 overall project. I do believe it's going to
24 change it, it's going to impact it. We look at
25 all of these traffic studies and environmental

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2 studies and everything that we get, but they don't
3 really show us the true picture.

4 what was brought up here tonight in the
5 public meeting I think was clear, when were these
6 traffic things taken and are they really relative,
7 you know, and how much impact do they really have?
8 They usually always have more impact than what we
9 are led to believe.

10 CHAIRMAN LAKE: Okay. They handled
11 everything pretty well. Like I said, I think
12 about a year ago it was very clear that Phase II
13 would hinge on the exit ramp onto 17. Some of the
14 other comments, you can address.

15 So, at this point if there is nothing else
16 from this Board, we are going to leave it open for
17 30 days, actually it's like 32 days, whatever it
18 is; you do agree to that?

19 MR. WELLS: Yes.

20 CHAIRMAN LAKE: Okay. And at that point then
21 motion to table for further action at the next
22 available meeting.

23 MR. CARR: So move.

24 MR. LUENZMANN: Second.

25 CHAIRMAN LAKE: who did the motion, Ralph?

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who seconded?

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MR. LUENZMANN: I did.

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CHAIRMAN LAKE: Ethel, call the role.

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THE CLERK: Mr. Dulgarian.

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MR. DULGARIAN: Yes.

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THE CLERK: Mr. Owen.

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MR. OWEN: Yes.

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THE CLERK: Mr. Carr.

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MR. CARR: Yes.

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THE CLERK: Mr. Capozella.

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MR. CAPOZELLA: Yes.

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THE CLERK: Mr. Luenzmann.

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MR. LUENZMANN: Yes.

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THE CLERK: And Mr. Lake.

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CHAIRMAN LAKE: Yes. Thank you.

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MR. WELLS: Okay, we will see you October

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20th. We will not re-advertise?

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CHAIRMAN LAKE: We will, I believe, we will

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re-advertise, yes. I believe that's our

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responsibility now, is that right?

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MR. BRODSKY: That's correct.

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CHAIRMAN LAKE: We will re-advertise.

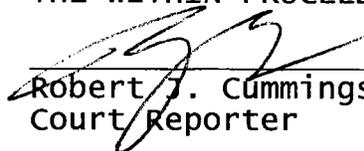
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MR. WELLS: Thank you.

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I HEREBY CERTIFY THE FOREGOING MINUTES
TO BE A TRUE AND ACCURATE TRANSCRIPT OF

THE WITHIN PROCEEDINGS


Robert J. Cummings, Jr. RPR
Court Reporter

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zoning 3:9, 14:22

PLANNING BOARD: TOWN OF WALLKILL
MIDDLETOWN, NEW YORK

-----X
Matter of the Application of:

GOLDEN TRIANGLE

SP/SUP & DEIS

Public Hearing

-----X
Town Hall
Middletown, New York
October 20, 2004

B e f o r e:

GARY LAKE

Chairman

ALAN DULGARIN
PATRICK OWEN
RALPH CARR
THOMAS HAMILTON
WILLIAM CAPOZELLA

RICHARD MCGOEY
DAVID BRODSKY, ESQ.
MARYLYNN HUNT

Engineer
Board Attorney
Secretary

Robert J. Cummings, Jr. RPR
Court Reporter

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2 CHAIRMAN LAKE: We did publish. I will have
3 MaryLynn read that.

4 THE SECRETARY: "Town of wallkill Planning
5 Board Notice of Public Hearing. Notice is hereby
6 given that a continuation of a public hearing of
7 the Planning Board of the Town of wallkill, Orange
8 County, New York, will be held at the Town Hall at
9 600 Route 211 East in said Town on the 20th of
10 October 2004 at 7:30 p.m. or as soon thereafter as
11 the matter can be heard that day on the
12 application of Golden Triangle Developers, LLC,
13 for approval of the subdivision and approvals of
14 the site plan and special permit for Phase I of
15 the Golden Triangle development.

16 "The applicant proposes to develop 95
17 townhome residences on approximately 18.9 acres
18 of the site in Phase I. The project site is
19 located south of Silverlake Scotchtown Road, west
20 of New York State Route 17 and north of New York
21 State Route 211 in the Town of wallkill, Orange
22 County, New York. And is designated in the Town
23 of wallkill tax map numbers 40-1- 16; 40-1-35;
24 41-1-45; and 50-1-62.

25 "This matter is pursuant to Section 249, page

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38 of the Zoning Law of the Town of Wallkill.

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"All parties interested will be heard at said time and place".

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CHAIRMAN LAKE: Okay, thank you.

6

Now, before we continue, this is, name for the record, please?

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MR. WOLINSKY: Larry Wolinsky from the law firm of Jacobowitz & Gubits. I am representing the applicant, Golden Triangle.

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CHAIRMAN LAKE: Okay, thank you.

12

Okay, Dave, the Phase I, which is they want to talk about right now, okay, is strictly residential.

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MR. BRODSKY: Correct.

16

CHAIRMAN LAKE: Okay? So, doesn't this phase of it fall in with the other ones?

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MR. BRODSKY: No, because this phase has already received a DEIS Notice of Completion. And under the terms of the moratorium, therefore, it falls outside the moratorium.

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CHAIRMAN LAKE: Okay, thank you. I just wanted to make sure we had that very clear on the record.

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MR. HAMILTON: That was back in June?

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2 MR. BRODSKY: I believe you are correct. I
3 actually thought you would have pulled it out for
4 Dick a moment ago.

5 MR. MCGOEY: June 30th.

6 CHAIRMAN LAKE: Okay, thank you.

7 MR. OWEN: Just, David, I have got a
8 question.

9 CHAIRMAN LAKE: Go ahead.

10 MR. BRODSKY: Yes.

11 MR. OWEN: Doesn't the moratorium say that we
12 can't give any preliminary approval to anything
13 that doesn't have preliminary approval?

14 MR. BRODSKY: Well, what it actually does is
15 it exempts -- it doesn't say you have to get to
16 the preliminary approval stage exclusively, it
17 says if you have gotten to other stages, but not
18 yet the preliminary approval stage, then you are
19 also exempt. For example, if you have received a
20 variance as part of the application, you are
21 exempt, and I refer you to --

22 MR. CARR: Section 3.

23 MR. BRODSKY: Section 3. "The Local Law
24 shall not apply to residential units which have
25 received prior to the effective date preliminary

1
2 or final site plan, subdivision special permit, or
3 variance approvals, or which have received the
4 S.E.Q.R.A. determination of no significant impact,
5 or for which a DEIS has been accepted".

6 MR. OWEN: Oh, okay.

7 MR. BRODSKY: And those are all "or", so, if
8 you hit any of those, you fall outside the
9 moratorium.

10 CHAIRMAN LAKE: Okay, thank you. I just
11 wanted to be sure we have got that very clear on
12 the record.

13 MR. BRODSKY: Absolutely.

14 MR. WOLINSKY: Mr. Chairman, members of the
15 Board, we are here this evening for the
16 continuation of the public hearing on the DEIS,
17 and also for review of the site plan.

18 with me this evening is our project
19 architect, the planner who prepared the EIS, and
20 our project engineer.

21 I believe with respect to the SEQURA hearing,
22 the reason it was kept open last time was there
23 was a letter from the Environmental Conservation
24 Commission that specifically requested that to be
25 kept open so it could submit comments. And for

1
2 the record, a letter has been submitted by the
3 Environmental Conservation Commission. As far as
4 I know, there are no other written submissions
5 that we received. But, again, all that will be
6 responded to in great detail in the Final
7 Environmental Impact Statement at such time as the
8 public hearing process is concluded.

9 CHAIRMAN LAKE: Why don't we go back to the
10 public. We have a couple of cards up here, I
11 believe.

12 So, at this time I will re-open, continue
13 with this public hearing from 9/15 at 8:03.

14 THE SECRETARY: Ed Estrada.

15 MR. ESTRADA: I would like to thank the board
16 for giving me the opportunity. I am Ed Estrada
17 from 16 Walsh Lane in Middletown, representing the
18 City of Middletown Board of Education.

19 What I would like to do is just read a letter
20 from the Board of Education and submit it to the
21 Board for your review.

22 CHAIRMAN LAKE: Okay, very good.

23 MR. ESTRADA: "Honorable members of the Town
24 of Wallkill Planning Board: Thank you for the
25 opportunity to comment on the Golden Triangle

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Phase I development project.

"First, the Enlarged City School District of Middletown would like to state that we address you with appreciation for allowing us to participate in your Town's planning and development with this letter and/or comments tonight.

"Second, by our presence here tonight, we are not attempting to modulate or stop any growth or construction within the Town of Wallkill. The Middletown City School District would simply like to request that some form of planning time be given to allow our school district the ability to be continue planning and preparing for the anticipated growth from the Golden Triangle and other housing projects currently before the Town Board.

"As we know it, it is estimated that the Golden Triangle project in our estimation would yield 30 to 75 new students to our school district. Although, by itself, this project appears to have only minimal impact, projected development from all of the Town of Wallkill housing projects that reside within the Middletown school district would have significant impacts in

1
2 our infrastructure and educational program.

3 "One example of a project causing us concern
4 is the impact on our district from the Tower Ridge
5 apartment complex. With 198 apartments, and
6 depending on who you go to for student estimates,
7 we understand that student enrolled from this
8 project alone could be from 100 to 250 students.
9 More analysis is necessary to arrive at a more
10 dependable number, and then to plan the
11 appropriate response by the school district to
12 that growth potential.

13 "The Enlarged City School District of
14 Middletown is, for all practical purposes,
15 surrounded by effects of the Town of Wallkill's
16 growth and development. Our high school is
17 currently severely overcrowded and we have a
18 capital improvement program that will expand the
19 building to a rated capacity of 2700 students.
20 When the new wing opens up in the year 2007, we
21 anticipate a student enrollment of 2200. Our
22 middle and elementary schools are also approaching
23 their rated capacities.

24 "The consideration of Middletown school
25 district's concerns and circumstances as you move

1
2 through your planning process will be greatly
3 appreciated.

4 "We would also like to ask if the Town of
5 Wallkill Planning Board would be willing to assign
6 one of your review members to act as liason to
7 the Middletown school district regarding these
8 matters so that we might formalize the increasing
9 cooperation between our two public entities.

10 "Thank you for your consideration and time.
11 Sincerely, the Enlarged City School District of
12 Middletown Board of Education".

13 Just for information purposes, and this is
14 it. Thanks.

15 CHAIRMAN LAKE: Thanks.

16 MR. ESTRADA: The Middletown High School
17 right now has a functional capacity when it was
18 built of 1300 students. The rated capacity is
19 1800 students. As I speak to you this evening,
20 there are 2100 students in the high school.

21 The improvements that we have scheduled for
22 the high school which, again, will not take effect
23 until the school opening of 2007, means that we
24 will have a gap of approximately 3 years before we
25 actually get to the rated capacity of 2700

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Comment 6-5

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students.

So, all of the developments that are in front of the Planning Board will obviously have a severe impact on how the school district has to restructure its students at that particular time.

Next year, beginning in September, the school district will also be instituting full day kindergarten, which obviously means that double the amount of kids that normally would be split between morning and afternoon kindergarten sessions will now be included all day in each of the elementary schools.

So, I just bring that as an update for you for the infrastructure. And, again, thank you for the opportunity.

CHAIRMAN LAKE: Thank you.

THE SECRETARY: Nida Gadstein.

MS. ^{Guenste}GADSTEIN: Good evening. Nida ^{Guenste}Gadstein,
14 Van Burenville Road. Resident.

I just wanted to bring some additional information forward. I do have a copy that highlighted areas that I gave a synopsis of the last time. But the one providing the development is compatible with its surroundings and a similar

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type intensity. If you look at the site, the pink is all residential. The yellow across the highway is PID. And they only have approximately 200 or 300 feet bordering the PID area.

Comment
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And looking at a map of the area, I would also like to ask that a traffic study be done because if you look at the site with a proposed entrance and exit, right now we have a lot of traffic that comes down Tower Drive, down 211, and I know we have a lot of congestion going onto the highway, but if you follow the blue line at Scotchtown Silverlake Road, and you have got a lot of development over here, these people are not going to go over to Tower Drive to come down the highway - they are going to come down Scotchtown Silverlake Road, I would think. I don't know, I am not a traffic expert, but I think this is something that should be addressed.

And, basically, that's it. Thank you.

CHAIRMAN LAKE: Thank you. I will take it.

THE SECRETARY: Salvatore LaBruna.

Comment
2-11

MR. LaBRUNA: Good evening. Salvatore LaBruna. I live on 4 Beth Drive, Middletown, New York. I am a member of the Conservation

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Commission.

I just wanted to talk briefly about a couple of things in our comments; number one, about referral to the County Planning Department. I feel pretty strongly that this project ought to be referred to the County. I am not sure, I know in the EIS, it did list the County Planning Department as one of the bodies that would be notified of the project, but as far as I know from the chairman, they haven't received anything and haven't had a chance to really look over the project. I think it would be beneficial for everyone involved if they had an opportunity to comment.

Comment
5-10



And I would just like to say on the traffic issue, I know that the proposed Town road, if it was just a residential development, I feel maybe it could have a beneficial impact. But I think with any, you know, benefit it would have would be heeded by the commercial development that would come in, especially if the interstate exit comes right through this Phase II development. With a hotel and restaurant, there would be far more traffic pulling off the road. Holiday traffic

comment 5-10

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would be a problem if there is major retail centers there.

And I think that's about it.

CHAIRMAN LAKE: Okay. Thank you. As far as the County goes, I believe the County has received way back when, before Mr. Church became commissioner, maybe that's why he doesn't remember it, but we are checking on that.

THE SECRETARY: John Paul ^{Haurich}~~Urlich~~.

MR. ^{Haurich}~~URICH~~: Hi. Good evening, 571 Barpole Road South. I am also a member of the Conservation Commission.

My first thought when I saw this project was it's big - it's pretty huge. There is no question that the resources that we are going to have to deal with from the Town are going to be -- are large. Like Sal and Nida mentioned, the traffic issues, I do believe the traffic study needs to be done. I am looking at all the different commercial centers in Orange County, I sit in traffic a lot waiting for people coming in and out of all of those retail stores. I don't know if the Town of Wallkill residents want to deal with that.

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2 You know, we have to think of the future,
3 really. Maybe impact won't be big now, but 5
4 years from now we are going to be sitting down
5 here again trying to deal with those problems.

6 silverlake is going to get a lot of effect of
7 the run-off, there is no question. Maybe we don't
8 have to deal with it now, but 5 to 10 years from
9 now, we will.

10 I read the DEIS, and I didn't see much about
11 lighting, or maybe I missed that, but I think the
12 Planning Board needs to look at that. There is a
13 lot of light pollution right now from the
14 Galleria.

*Comment
2-12*

15 That's about it. I really think we need to
16 look at the traffic, especially, I really do.

17 Thanks.

18 CHAIRMAN LAKE: Thank you. Anybody else?

19 THE CLERK: No.

20 CHAIRMAN LAKE: Okay, come on back up.

21 I will just make a couple of comments. First
22 off, I am sure we have had a couple of traffic
23 studies already done, and they are in there.

24 The lighting, we always look at the lighting
25 very carefully. I think we have been a little

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2 accused of being a little too hard on lighting
3 sometimes with some of the retailers.

4 As far as the traffic does go, and maybe I
5 should let Dick explain, but this project as an
6 whole, is part of an awful big traffic
7 improvement, which I think is a total price tag of
8 about 1.2 million off their site. That's besides
9 what they are going to do, along with I think it's
10 5 to 9 other places.

11 So, the traffic is being looked at very
12 carefully. And I think we are in tune as a whole
13 Board about the traffic. And this project is
14 linked very heavily to certain traffic
15 improvements.

16 But we do pay an awful lot of attention to
17 the traffic in this area. We do pay a lot of
18 attention to the lighting. And we stay on top of
19 it with our experts, I think, beyond a lot of
20 people's imagination could have expect us to.

21 MR. MCGOEY: Just to add, there were two
22 traffic studies done - one was performed by the
23 applicant. The Planning Board obviously had
24 concerns about isolating this project and doing a
25 traffic study by itself, so they asked for the

1
2 generic traffic study be done for the whole area,
3 and to include 10 projects, plus some additional
4 background development that could occur over the
5 next 15 years. That traffic study was done. It
6 identified major roadway improvements throughout
7 the corridor, including Scotchtown Silverlake
8 Road, Maltese intersection with Bert Crawford
9 Road, Tower Drive and Route 211, Tower Drive and
10 Industrial Drive, Tower Drive and Scotchtown
11 Silverlake Road.

12 The Planning Board put together a plan to
13 have all of those traffic improvements constructed
14 by the developers. Each developer would take a
15 share of the improvement and construct it so it
16 will get done. And those improvements are in the
17 works today. You will see a new traffic signal go
18 up at Industrial Drive and Tower very soon. You
19 will see a traffic signal go up at Scotchtown
20 Silverlake Road and Tower Drive. And you will see
21 a road widening, if this project proceeds, on
22 Scotchtown Silverlake Road for turning lanes. And
23 other improvements - a double left-turn lane at
24 Route 211 and Tower Drive to eliminate the queue
25 lengths that you see at peak hours at that

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location.

And in addition to that, not only is this project being asked to contribute as part of Phase I, but they will also be contributing additional road area wide road improvements as part of Phase II - if they ever proceed. And the Board is also, and you will find, if with reach the statement of findings period, you will find that they are going to require that the new exit ramp be constructed as part of any further development of Phase II in this project.

So, that gives it to you in a nutshell.

CHAIRMAN LAKE: Right. Thank you, Dick.

Okay, anybody else? If not, motion to close this public hearing at 8:16.

MR. CARR: So move.

CHAIRMAN LAKE: Ralph. Second?

MR. CAPOZELLA: Second.

CHAIRMAN LAKE: Bill. Call the role.

MR. BRODSKY: In your motion perhaps you might also want to specify what the comment period will be.

CHAIRMAN LAKE: I was going to do that after, I mean I can do that now. The public comment, 10

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days after?

MR. BRODSKY: At least 10 days. I think you have already specified 10 days.

CHAIRMAN LAKE: Right, I mean, okay, I was going to do that after, but I will do that now.

Motion to close the public hearing, but once the public hearing is closed, there is also a 10 day written comment period that you can continue making comments about the project that will also be put into the documents in the record.

Motion to close the public hearing then?

MR. CARR: So move.

CHAIRMAN LAKE: It was Ralph. Second?

MR. CAPOZELLA: Second.

CHAIRMAN LAKE: Bill. Elba, call the roll.

THE CLERK: Mr. Dulgarian?

MR. DULGARIN: Yes.

THE CLERK: Mr. Owen?

MR. OWEN: Yes.

THE CLERK: Mr. Carr?

MR. CARR: Yes.

THE CLERK: Mr. Hamilton?

MR. HAMILTON: Yes.

THE CLERK: Mr. Capozella?

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MR. CAPOZELLA: Yes.

THE CLERK: And Mr. Lake?

CHAIRMAN LAKE: Yes. Okay, go ahead.

MR. WOLINSKY: Okay, I think that concludes the SEQRA portion of our proceedings tonight. I am going to turn it over to Lorraine from Lanc & Tully so she can go over the site plan with you. And I know Dick has quite a number of technical comments. Lorraine?

MR. MCGOEY: I don't know if we could go over those point by point. We will figure out where we are in the process.

MR. WOLINSKY: Excellent.

MS. POTTER: Is that okay with the Board?

CHAIRMAN LAKE: What is that?

MR. MCGOEY: That I don't think we don't have to go through all the technical comments --

CHAIRMAN LAKE: No, I just want to bring the Board up to speed, and then I want to go through the Board, and let them go back to workshop.

Go ahead.

MS. POTTER: Lorraine Potter from Lanc & Tully Engineering.

Since we have last been before the Board we

1
2 had contact, our consultants have had contact,
3 with the Army Corps of Engineers in regard to the
4 wetlands and wetlands mitigation.

5 There is a stream that is designated on the
6 site that was originally shown as wetlands. We
7 have spoken to Mr. McGoey about it. The Corps
8 does not constitute that area as wetlands,
9 however, they do consider it a stream and,
10 therefore, we are required to not disturb more
11 than 200 linear feet of stream bed for this
12 project, for the Phase I of the project.

13 Therefore, we have modified the plan
14 accordingly. We previously had a horseshoe shape
15 near the recreation area, and now it is turned out
16 to just a stream crossing with a stub road at that
17 point. This will meet the Army Corps' request for
18 minimizing the stream disturbance.

19 With doing this, we have reduced the number
20 of units to 89 units. Otherwise, the plan remains
21 virtually the same as we had presented before.

22 We have received Mr. McGoey's comments and we
23 will address them as we develop the plan.

24 CHAIRMAN LAKE: Thank you. Let me go through
25 the Board. Doug?

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MR. DULGARIN: Come back to me, please?

CHAIRMAN LAKE: Patrick?

MR. OWEN: I will wait.

CHAIRMAN LAKE: Ralph?

MR. CARR: I have really nothing in addition. I do have a question. This is going to be a private road internally.

MS. POTTER: Yes.

MR. CARR: Are school buses, will they go in?

MS. POTTER: Normally school buses do not go in, unless the school district themselves want to. On a private road --

MR. CARR: Normally they do not.

MS. POTTER: They do not.

MR. CARR: So, what --

MS. POTTER: At the intersection, at the major intersection, you will see where we have like a covered bridge going over a sidewalk and whatnot, we are also going to work with the architect on developing that as a school bus stop that the children in inclement weather will be able to stand under.

As far as school buses are concerned, on other projects that I have dealt with, the bus

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2 companies do not want a special pull-off of the
3 road because of safety reasons. They want traffic
4 stopped.

5 CHAIRMAN LAKE: Okay, you know what, though,
6 I think Ralph brought something up that's very
7 important because we do have a project in Town
8 where we do have school buses leaving a road onto
9 the project.

10 MS. POTTER: Right.

11 CHAIRMAN LAKE: And that's Fairways. And I
12 sure would be interested in seeing something like
13 that done here.

14 MS. POTTER: We will contact the school.

15 CHAIRMAN LAKE: I realize it might not be
16 their policy now, but surely if we can develop an
17 area where that bus can get in there and get out
18 in a safe manner, it has to be a lot safer for the
19 time being. And I think that was an excellent
20 thing you just brought up, Ralph. I think this is
21 where we can make some real -- we have one, I
22 don't see why we can't have two.

23 MS. POTTER: And what was the project?

24 CHAIRMAN LAKE: Fairways.

25 MR. HAMILTON: On Golf Links Road.

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2 CHAIRMAN LAKE: And they pull right off the
3 road and they developed a little ring in there for
4 them to turn around. I can't remember all the --

5 MR. HAMILTON: Actually, like a drive you go
6 in where they can go in and come back out.

7 MS. POTTER: Come back out.

8 MR. CARR: That was one point. And I guess
9 in addition to that, I mean, everything has been
10 covered before in terms of addressing them, and,
11 Dick, I guess you received the report on storm
12 water run-off.

13 MR. MCGOEY: Not yet.

14 MS. POTTER: That is being worked on.

15 MR. CARR: So that would be one concern.

16 And, certainly, as was mentioned, traffic.
17 And, again, to me this Phase I simply adds and,
18 granted, while we have done lots in terms of the
19 generic traffic study and the lights, the
20 additional lights, the synchronization of the
21 lights, the turning lanes and so forth, this is an
22 area that is increasingly burdened with more
23 traffic. This adds to it. While there are
24 some mitigants, there is going to be increasingly
25 more traffic here from this project, from other

1
2 project, from outside the area.

3 To me, Phase II offers an alternative where
4 you could have a much better traffic flow. There
5 is only so much these roads can hold. And Phase
6 II, done properly, with a through road and a
7 changed exit ramp, whether that's pie-in-the-sky
8 down the road, but it does offer a great
9 alternative and to the traffic from Scotchtown,
10 Mud Mills -- unfortunately, I think this, at this
11 time, adds, while mitigated by some of the
12 improvements that we are making, does add further
13 to the current traffic.

14 That's all.

15 CHAIRMAN LAKE: Okay, thank you, Ralph.
16 Bill?

17 MR. CAPOZELLA: Well, I know this project has
18 been in front of a lot of you guys way before my
19 time here, I mean there are some things I like
20 about it - the buffer zones and the way they did
21 the sidewalks and so forth. But, again, I just
22 look at all of the projects that came before us
23 and some of them were already in the works and
24 flooding that area again with the traffic, and I
25 know the school system. I mean these are good

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2 points that we are totally building that whole
3 area up. And, you know, this project definitely
4 adds something to it.

5 I know they are in the works with the Phase
6 II of this, but that really hasn't gone anywhere,
7 as far as I know at this point.

8 So, looking at it, you know, just the way it
9 is right now, it would be an issue to me.

10 CHAIRMAN LAKE: Okay, Tommy?

11 MR. HAMILTON: The school impact is one. The
12 new ramp, like we were talking about, I would like
13 to have it where we had a guarantee that this new
14 ramp is going to happen with this project going,
15 but not knowing if Phase II is ever going to get
16 off the ground, like you said, we are just
17 impacting the existing roadways. And when this
18 project first came in as one big parcel, that was
19 the big selling point - the new Town road with the
20 new ramp, it was going to alleviate people going
21 down Tower Drive and this and that. And now we
22 really don't know if it's going to happen. We
23 have no guarantee that the State is going to say
24 yes to that ramp. What's going to happen and all?
25 And that's what we were looking at from day one

1
2 when this project first came. At least that was
3 my understanding, all right?

4 The other one is the new storm water
5 regulations - how are they going to treat it and
6 everything else. Is this what you had asked for?

7 MR. MCGOEY: I asked for that.

8 MR. HAMILTON: New regs that are in place now
9 that we just found out about in a work session we
10 had with the state.

11 MR. MCGOEY: They haven't submitted it yet.

12 MR. HAMILTON: They haven't submitted it yet.

13 Okay, 11, Fire Department comments. I am not
14 sure what they were. I would like to see what
15 their comments have been.

16 And, Dick, your item number 16, yes, that's
17 true, how do we know this water line being it's on
18 the burden of another applicant, with another
19 project - you get that main water line in. If
20 that project doesn't go on, where is this project
21 going to get water from? We don't know.

22 Okay, let's see here - water, storm water,
23 the ramp, the school. I know we did a traffic
24 study, but that was all keyed in with that new
25 ramp.

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2 For our attorney, years ago we had a project
3 come in, they came in for phasing and it was
4 granted their approval and so forth. And all of a
5 sudden something never happened to us before, the
6 applicant sold the phases. So now, all of a
7 sudden, we had a phase that was sold off, and now
8 we have other phases later down the years, other
9 people bought, and now we are trying to get them
10 up to speed on doing what the original approval
11 said. And we have been having problems with
12 accomplishing that ever since. So, is there a way
13 we could have something written that it's going to
14 be all one project, where they can't sell this
15 phasing, and what happened to us, or is there a
16 way of us getting covered to make sure those items
17 happen when these other phases come in.

18 MR. BRODSKY: There should be bonding,
19 conditions of approval, you know, if you are
20 approving Phase I based on certain conditions, you
21 have to make sure that those conditions are
22 satisfied before they can move onto later phases.

23 MR. HAMILTON: But if there is a bond say to
24 cover improvement that are actually in say a Phase
25 II part of the project, and now some new owner

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2 comes in, can you use that bond to develop
3 something that he now owns that the original guy
4 did not own?

5 MR. BRODSKY: No, but the subsequent phasing
6 is going to have to come in on an application that
7 will stand on its own. And you already will have
8 considered the total impact of the project when
9 the initial application came in, but you only have
10 approval for Phase I. So, when you get to Phase
11 II, all of the impacts that are cumulative that
12 you need to be addressed as a result of Phase II,
13 you would then address during the approval process
14 for Phase II.

15 MR. HAMILTON: Even if the Phase II project
16 is completely different than what the original
17 owners had for Phase II?

18 MR. BRODSKY: Well, then you can modify, the
19 impacts may be modified, but certainly you are
20 still looking at the cumulative impacts and the
21 extent to which those are contributed to by Phase
22 I and then Phase II. And the fact that the
23 ownership changes means nothing to this Board
24 because it does not change the impacts or the type
25 of application that comes before this Board.

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2 The bottom line is the original applicant
3 could change Phase II from what was originally
4 contemplated also. So, it's immaterial to who is
5 making the application. We still have to address
6 the impacts and the modifications of the phasing
7 as they come in and deal with the phases each on
8 its own merits based upon the overall contribution
9 to the impacts.

10 MR. HAMILTON: But my understanding with this
11 Phase I, this Phase I was presented before us and
12 we are looking at the end line result of, yes,
13 having this new road ramp and so forth. Now like
14 we had mentioned before, what if Phase II doesn't
15 happen for years? You have this piece of it that
16 we can't mitigate the way we envisioned originally
17 because this other parcel doesn't exist yet. So
18 now we have to live with Phase I without this new
19 road ramp and so forth until somebody comes in --

20 MR. BRODSKY: Well, that's up to the Board as
21 to whether the impact at Phase I requires that
22 ramp. If you feel at this stage that you require
23 the ramp, then you will vote that way. If you
24 feel that the impact isn't substantial enough
25 until we get to Phase II, and then you need it,

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then we require it for Phase II.

MR. HAMILTON: But the until thing is what scares me.

MR. BRODSKY: Well, the Board has to make that determination.

MR. WOLINSKY: I just want to bring briefly the Board up to date on the road, because I see you are very concerned about it. All the departments in the DOT, Traffic, Safety, et cetera, have signed off on the road. I believe the Federal Highway Administration is fine with it in terms of it being consistent with I-86, and the only thing that's holding us up now is, as I understand it, is it's caught up in the Exit 120 stuff. And as soon as that gets resolved, we are going to be off and running and finalizing the interchange modification study.

So there is a very good likelihood that - I don't know how long it's going to take - but there is a very good likelihood that this is ultimately going to happen because we are getting all the right signals from the regulatory agencies.

CHAIRMAN LAKE: Wait a minute. Let me ask you something now, you are saying you are getting

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all the regs; are you getting anything in writing?

MR. WOLINSKY: Yes, there is a letter. Is there not a letter that's been submitted? I believe it is, has been --

MR. HAMILTON: Submitted to who?

MR. WOLINSKY: To us.

CHAIRMAN LAKE: The Feds are going to -- are they really given, the Feds, have they given you anything?

MR. WOLINSKY: I think, I am not sure, I think the Feds have communicated, as I understand it, back through the State, and I believe that there is not a problem with the I-86 issue, that's my understanding, is that correct?

MR. JEREMIAS: Yes.

MR. WOLINSKY: Okay. So, Phil Grealy is not here tonight. He could explain it to you in a lot more detail because he's the guy who's involved in all the details with that. But my understanding is what's not allowing this to shoot forward is the Exit 120 stuff. It's all tied up in the same corridor.

CHAIRMAN LAKE: In all fairness to this Board, maybe I missed it, but this is the first

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2 I've heard that. I never thought this was tied to
3 122 or it being delayed because of the 122.

4 MR. WOLINSKY: 120.

5 CHAIRMAN LAKE: 120, down East Main.

6 MR. WOLINSKY: I am sorry, 122. Mikel can
7 explain that.

8 MR. JEREMIAS: Mikel Jeremias, I am one of
9 the developers.

10 I have been in touch very frequently with
11 Phil Grealy from John Collins Engineering. And
12 the way the process began like about almost a year
13 ago is we submitted all the studies for the to the
14 improvements linking I-84 exit and widening of
15 17 and all the interchanges. And it is submitted
16 to DOT. It took them about 6 months. They said
17 they are not going to submit it -- first of all,
18 they said after the Federal Highway Department has
19 to get involved because it's becoming I-86. And
20 they said they are not going to submit anything to
21 the Federal government until all of the
22 departments feel that the project is viable and it
23 is an improvement for the area.

24 It took us about 6 months to get all of the
25 departments within DOT - Safety and Traffic and,

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2 you know, it was like 6, 7 departments, Design.
3 They all agreed to sign off on the project. And
4 now it's the Federal Highway knows about the
5 project, they looked at it briefly.

6 But the only thing that's holding it up is
7 some of the numbers of the projections are
8 inconsistent with Exit 120.

9 MR. WOLINSKY: 122.

10 MR. JEREMIAS: 122, sorry. They are waiting
11 for the consultants for almost a year to get the
12 right numbers. So, it's not directly linked with
13 the improvements of 122, it's just some numbers
14 that have to be right. According to Phil Grealy,
15 we should get the numbers straightened out in the
16 next couple of months, and within the year, that's
17 when we can expect final approval of this.

18 Thank you.

19 MR. HAMILTON: Who is that from?

20 MR. BRODSKY: Where are the numbers coming
21 up, are they coming from Collins?

22 MR. JEREMIAS: No, the consultant.

23 MR. WOLINSKY: The Exit 122 consultants and
24 Collins' numbers didn't jive, I think, and they
25 are sorting those out. And I think that DOT, from

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2 what I remember now that Phil told me, I believe
3 DOT believed Phil's numbers more than their own
4 consultant's numbers. They sent their own
5 consultant back to the drawing board, and that's
6 what we are waiting for.

7 MR. HAMILTON: Okay, the letter, when was the
8 letter?

9 MR. JEREMIAS: A couple of months ago.

10 MR. WOLINSKY: We gave that to the Board.

11 MR. JEREMIAS: I think we did.

12 MR. HAMILTON: Who is that from?

13 MR. WOLINSKY: DOT.

14 MR. JEREMIAS: DOT.

15 CHAIRMAN LAKE: Okay, you know, like I said,
16 you just really surprised me where you told me
17 this thing was tied to 122 now, you know, because
18 let's face it, that can be 5, 6 years away yet.

19 MR. WOLINSKY: well, it's analytical, I think
20 what he's saying it's analytically tied to it in
21 the traffic study. They look at all of the
22 interchanges is when you do one of these things.
23 They don't look at them independently.

24 CHAIRMAN LAKE: We have been here 3 years
25 with this now, how long we have been working with

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this thing.

MR. WOLINSKY: A lot shorter than Exit 122. I mean this project stands it on its own, but they have got to come to an agreement on the data.

CHAIRMAN LAKE: Okay, I think you better bring Phil in so we can get this, you know, you just threw something, you started talking 122, and I kind of -- and I realize they look at it all, but I didn't think anything was being held up by it.

MR. WOLINSKY: I will have Phil send you --

CHAIRMAN LAKE: I don't want to speak for the Board, but I think the Board is kind of a little shocked by the statement.

MR. WOLINSKY: I will have Phil send you a letter of explanation and how it might impact on the timing of this project, okay?

CHAIRMAN LAKE: Yeah, okay.

MR. WOLINSKY: Sounds like that's what you want.

CHAIRMAN LAKE: Yeah, if not an actual work session.

MR. WOLINSKY: That's fine as well.

CHAIRMAN LAKE: To bring everybody -- I think

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this is a pretty big issue. Doug?

MR. DULGARIN: Coming back to me now?

CHAIRMAN LAKE: If you want. Tommy, are you done?

MR. HAMILTON: I just want a clarification on the water line, what happens if the other project isn't a go; how do you get water?

MS. POTTER: Then we will be bringing the water line over by this project specifically. We will be connecting Tower Drive water line crossing the Quickway, coming through. Ultimate goal is once Phase II happens, the ultimate would be to continue a water line to connect to the intermediate pressure zone that is over by the Kabro project. We have met with Ed Smith regarding that, and I know Ed has talked with Dick regarding this also.

MR. HAMILTON: So now we are tied back into Phase II again with something else.

MS. POTTER: Not specifically for Phase I. Phase I would be able to stand on its own with the connection through Tower Drive, but it ultimately for Phase II we would be making a connection for the Town to tie their complete water system

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together.

MR. HAMILTON: One other, Dick, with the little strip thing that's going to go in front of this, has any coordination been worked out with the application in that little strip?

MR. MCGOEY: They haven't come back, that applicant. Are you talking about the mini storage warehouse and the retail?

MR. HAMILTON: Yes.

MR. MCGOEY: They have not come back.

MR. DULGARIN: They are going to re-design.

MS. POTTER: If you don't mind, I could speak. They have gone to the ZBA. That's where that is at. There will be a public hearing November 8 on that.

MR. HAMILTON: I know it's in the works. I have heard that they are proceeding.

CHAIRMAN LAKE: Is ZBA, as it was here? It went to the ZBA with the same site plan?

MS. POTTER: Same site plan it went to the ZBA.

CHAIRMAN LAKE: Did we send them?

MR. DULGARIN: No, I thought we asked them to re-design and re-visit. Didn't like it.

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CHAIRMAN LAKE: Let's stick to this one.

MR. HAMILTON: That's all I have.

CHAIRMAN LAKE: Doug?

MR. DULGARIN: First all, let me apologize to you guys, I know you guys want to get home and watch the game, but I have got a couple of questions.

First off, it's great to see the Conservation Committee and the school board representatives here, and I hope you guys participate in all of our larger projects. You are very welcome.

Dick, what do we expect to accomplish tonight, just close the public hearing and receive more information, and that's it?

MR. MCGOEY: Yes.

MR. DULGARIN: And then another work session?

MR. MCGOEY: They have got to start to work on their Final Environmental Impact Statement, the storm water management has to be revised.

MR. DULGARIN: So, in other words, questions we have on storm water and this proposed water feature and what these retention/detention areas will look like, that's all going to come out?

MR. BRODSKY: As part of the comments

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2 received, you are now going to review an FEIS and
3 to make sure that is complete, as you did with the
4 DEIS.

5 MR. DULGARIN: Okay, but document aside, the
6 actual site plan review of the storm water run-off
7 and what we are going to be seeing from the road,
8 what sort of features that will be controlling the
9 storm water, you will have an idea what it's going
10 to look like - is it going to be grassy and hidden
11 or if it's going to be this mangey looking thing
12 with weeds growing out of it?

13 MR. MCGOEY: They will have to put those in
14 the site plan for review.

15 MR. DULGARIN: Let me say I am not a big fan
16 of this type of housing, but all studies show that
17 it is needed. And for that reason, I agree that
18 as long as they are jumping through all the hoops
19 and meeting everything that's required, you know,
20 it's going to happen, or it seems like it's going
21 to happen. I am not a big fan of the townhouses
22 in wallkill, but what are you going to do?

23 I have a question, and I guess it's for you,
24 about how are we supposed to, or to what extent do
25 we accept the expertise of the school board, and

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2 how is that going to show up in the final, and how
3 much clout does that have with us?

4 we have always been told in the past that we
5 can't look at the impact on schools, or impact on
6 fire, unless we had experts in that field. If we
7 had experts in that field and they are giving us
8 certain information, can we require mitigation for
9 that somehow, or is that automatically done with
10 school taxes?

11 MR. BRODSKY: You make a determination as to
12 whether the FEIS is complete as to how it
13 addresses the issue. The applicant is going to
14 provide the FEIS and presumably, if that's an
15 issue, they will need to provide some type of
16 investigation in order to address the issue.

17 MR. DULGARIN: well, in the draft the figures
18 they used for school aged children per unit is
19 something that I question. And the school board
20 didn't come up with an exact, but they threw out
21 numbers that were far from what was put into the
22 draft. Is that going to have to be one of the
23 items to be addressed at final?

24 MR. BRODSKY: Yes if it's not addressed
25 satisfactorily, this Board will say so. And,

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2 theoretically, you could actually go through
3 another hearing in order to address issues which
4 are not adequately addressed, or new issues that
5 come up, so that you have the proper studies that
6 satisfy the Board that either there is no impact,
7 or the impacts are being mitigated appropriately.

8 MR. DULGARIN: Okay. Thank you.

9 As far as Phase II of this project, I also
10 agree with Ralph and Tom that that is the better
11 phase of this project. And that will relieve a
12 lot of the pressure that's going on, and it will
13 have a minimal effect, and it will cure a lot of
14 our other ills in this neighborhood.

15 Tom brought up phasing, and I know we got
16 Phase I, Phase II. For lack of a better question,
17 is Phase I going to be phased?

18 MS. POTTER: No.

19 MR. DULGARIN: In other words, you have to
20 have every unit done before you receive one C/O?

21 MS. POTTER: It depends how it's set up with
22 the Building Department and with the Town
23 Engineer.

24 MR. DULGARIN: Well, what are you going to
25 ask for?

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2 MS. POTTER: What they can do, and it depends
3 on how the Town Engineer and the Building
4 Department looks at it, whether you can, as you
5 continue, whether you can start building certain
6 buildings as the road goes along, as your
7 improvements go along, or if they require all of
8 the improvements to be put in prior to the C/O.

9 MR. DULGARIN: I think that was part of Tom's
10 question, or part where Tom was leading, what had
11 happened to us in the past, if we approve part of
12 these and you got C/O's for some of these, and for
13 some reason the market went away, or Phase II
14 didn't happen, and now all of a sudden we didn't
15 have this whole road that flowed through this
16 project, and we just had a partial; we need to be
17 protected for that.

18 MS. POTTER: That's also why the performance
19 bond is being done - it's on the entire project.

20 MR. DULGARIN: It would be on every unit.

21 MS. POTTER: It's on the entire project. We
22 have to give a construction cost estimate for all
23 of the improvements, so, therefore, the money is
24 bonded and there, should something happen within
25 during the construction.

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2 MR. DULGARIN: Okay, that's fair enough, as
3 long as the bonding covers the entire project.

4 If DOT, or the Feds, whoever the governing
5 body is, approves the ramp and the roads that come
6 through your property, who pays for that, who
7 builds that?

8 MS. POTTER: The roads?

9 MR. DULGARIN: The ramp of --

10 MR. WOLINSKY: We do. The project builder.

11 MR. DULGARIN: The project builder. So, that
12 burden would be lifted from the taxpayer to build
13 the ramp?

14 MR. WOLINSKY: Yes, it would be lifted from
15 the taxpayer. It doesn't preclude, however, if
16 there is a grant out there, or a Federal Highway
17 grant, or something like that that we could take
18 advantage of, yes.

19 MR. DULGARIN: That's fine, that's fine.

20 MR. WOLINSKY: But, otherwise, it's all --
21 that's one of the reasons why we are developing
22 Phase I first because that helps generate some of
23 the cash flow to actually construct the through-
24 road, to gain the capital for that.

25 MR. DULGARIN: Another question for you then:

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2 If, to use your term, if Collins' traffic study,
3 which I believe that's who we used for the local
4 traffic study for Kabro and M.K. and everybody,
5 you said that his numbers didn't jive with the
6 numbers that the DOT had; you said they didn't
7 jive?

8 MR. WOLINSKY: No, No, no, not that study,
9 the interchange justification study for Exit 120.
10 You have to do a separate study to justify the
11 ramp reconfiguration. And I think it was the
12 numbers in that study that were not jiving with
13 the State's numbers.

14 MR. DULGARIN: So it had nothing to do with
15 the numbers that were generated in our study?

16 MR. WOLINSKY: Absolutely not, no.

17 MR. DULGARIN: Then the second half of my
18 question is moot then.

19 The last thing I will just point out is, and
20 I am glad we are going to have a couple of work
21 sessions because with your comments and some of
22 the stuff that was brought up, there is still a
23 lot of unknowns about this, and you are going to
24 have at least one, maybe more?

25 MR. MCGOEY: Yes.

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MR. DULGARIN: Okay, that's all I got.

CHAIRMAN LAKE: Patrick?

MR. OWEN: Gary, it's been said before, but really for me the second phase of this is the real selling point. And without knowing necessarily where we are going to proceed with that, it makes it difficult to just take this project as Phase I, which I think is going to be the greater impact upon different resources and upon the Town itself. That's it.

CHAIRMAN LAKE: Thank you. Ralph, did I come to you?

MR. CARR: Yes, but I just want to say one more thing. I just wanted to thank Mr. Estrada for coming here tonight because in the 3 years I have been on the Board, other than the last meeting, that Doug has pointed out before, we never heard from a school board. And I think with all of the talk of intermunicipal coordination and working together, this is the first time. So I think it's great that he was here and I think his idea and the school board's idea of having a liaison with the Planning Board is a good one. And I would volunteer Mr. Dulgarian. Doug is

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always interested in these things, so --

CHAIRMAN LAKE: I would also do that.

MR. HAMILTON: Can we vote?

MR. DULGARIN: Well, I won't let you guys
down.

CHAIRMAN LAKE: Anything else?

MR. CARR: That's it.

CHAIRMAN LAKE: Thank you. Bill, Tom,
anything else?

MR. HAMILTON: One more item that was
mentioned about bonding on one of the things are
to be done - Dick's comment number 20 is about, it
might be a little minor, but it's about a cabana
in the pool area will be constructed prior to
issuance of any C of O's. How many other things
have to be done on there before C/O that are tied
in with Certificate of Occupancy?

MR. MCGOEY: They have to have all of the
public improvements done.

MR. HAMILTON: I think that's what Doug was
trying to get at, when these items have to be
done. Not that they do the first buildings close
to the road, they want their C/O's on their when
we don't have the rest of that roadway.

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2 MR. MCGOEY: No, we work on that as part of
3 the details of construction.

4 MR. HAMILTON: That's Planning Board. We
5 determine when those are, and then that just gets
6 referred to the Building Department.

7 MR. MCGOEY: That's correct.

8 MR. HAMILTON: The Building Department
9 doesn't set it. We set it.

10 CHAIRMAN LAKE: Okay, anything else, guys?
11 Then public hearing is closed.

12 Dave, do you have any comment on the SEQRA or
13 just let them go back to work session?

14 MR. BRODSKY: We are going to go ahead with
15 the FEIS process, and I think the workshop is
16 where we need to go.

17 MS. POTTER: We are on schedule for another
18 workshop.

19 CHAIRMAN LAKE: Very good.

20 Motion to table for further action and send
21 them back to a work session; and I remind
22 everybody there is a 10 day written comment period
23 yet that you are more than welcome, any comments
24 you have.

25 MR. DULGARIN: So move.

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CHAIRMAN LAKE: Doug. Second?

MR. CARR: Second.

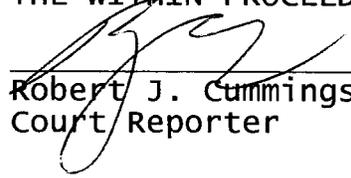
CHAIRMAN LAKE: Ralph. All in favor?

("Aye" responded to)

CHAIRMAN LAKE: All opposed? None. Okay.

Thank you.

I HEREBY CERTIFY THE FOREGOING MINUTES
TO BE A TRUE AND ACCURATE TRANSCRIPT OF
THE WITHIN PROCEEDINGS



Robert J. Cummings, Jr. RPR
Court Reporter

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Appendix D

Calculations for
Pollutant Loading

POLLUTANT LOADING CALCULATIONS
COVERED BRIDGE AT GOLDEN TRIANGLE
TOWN OF WALLKILL, ORANGE CO., NY

JUNE 13, 2005

Comment: #3 – Letter from Salvatore J. LaBruna, Wallkill Conservation Commission, dated May 2, 2005:

In response to our previous comments, the applicant has included pollutant loading calculations for stormwater discharges in an appendix to the FEIS. The project sponsor also reports that the stormwater management practices chosen for this site will result in a 59% reduction in total suspended solids (TSS) and a 66% reduction of total dissolved solids (TDS). The document does not clearly state if this represents a reduction from the developed site without stormwater controls, or compared to existing undeveloped conditions. If the reduction were based solely on the use of stormwater management practices, this would still represent an overall increase from the existing conditions and should be clearly indicated. If the developed site with controls will result in a reduction compared to the undeveloped site, this calls for a detailed explanation. Furthermore, there is no discussion of the significant increase in both Nitrogen (TN) and phosphorous (TP) levels in the effluent. The amount of TN will increase from 59.86 to 139.79 (no units specified, but we believe this is pounds annually). The amount of TP will increase from 3.70 to 9.78. On a percentage basis this appears to be a substantial upsurge. These two substances are strongly linked to the growth of algae blooms in many bodies of water, and in this case may represent a potential risk to Silver Lake. The effect of this project viewed in isolation might not be significant, but the cumulative effects of this and other pending projects in the Silver Lake watershed, including some that may not have been required to comply with new stormwater regulations, are a serious concern.

Recommendations: #3

Stormwater Runoff: The applicant should study the potential threat posed by the increased levels of both nitrogen and phosphorous in the effluent, specifically whether the amounts indicated in the pollutant-loading calculations could lead to the formation of toxic algae blooms in Silver Lake. The FEIS should also clearly explain how and why the TSS and TDS would differ from existing conditions.

Response to Comments:

Although pollutant-loading calculations are not required by the New York State Department of Environmental Conservation for permitting of stormwater discharges, revised pollutant-loading calculations

have been prepared in response to the Conservation Commission comments and are included below. All proposed stormwater facilities on the site are specifically selected according to the design criteria listed in the NYSDEC *Stormwater Design Manual*, Chapter 7, for treatment of the water quality volume. The NYSDEC places emphasis on the reduction of total suspended solids (TSS) and total phosphorous (TP). Performance criteria in Chapter 5 of the NYSDEC *Stormwater Design Manual* identify these two pollutants as indicators for purposes of appropriate design of stormwater treatment systems. While post-construction discharge typically contains sediment, nutrients, and heavy metals, the studies upon which the accepted stormwater management practices are based show that reductions of 80% of total suspended solids and 40% phosphorus could effectively treat all other pollutants found in urban runoff. In response to the Commission's concern, the project stormwater systems have been revised to include the use of bioretention areas with surface sand filters to further reduce the amount of pollutant loading discharging from the project site. Overall, the proposed site now utilizes several dry swales, a wet retention basin and the bioretention/sand filter combination to reduce pollutant loadings to the greatest extent practicable.

The pollutant-loading calculations have been revised for pollutant loadings to reflect the plan revisions, which were made throughout the stormwater network for the Covered Bridge at Golden Triangle project. The new values represent the new percentages of removals with the stormwater practices in series. To develop a conservative approach, only areas of development have been analyzed for the calculations. Any comparisons made from the calculations represent the difference between pre-development conditions and post-development conditions with the treatment of the stormwater facilities. The concentration loading rate for each constituent has been revised to reflect the most current available value for the development and the specific stormwater facilities proposed.

The stormwater facilities on site have been designed to meet all NYSDEC requirements for stormwater treatment, including as mentioned above, an 80% reduction in TSS and a 40% reduction in TP. Through the use of these stormwater measures, TSS in the developed portions of the site will be reduced from 625 lbs/yr pre-development to 60 lbs/yr post-development, a 90% reduction. Total dissolved solids (TDS) will be reduced from 5,087 lbs/yr pre-development to 588 lbs/yr post-development, an 88% reduction. The pollutant loadings for metals (copper and zinc) will not increase.

The TSS and TDS are greatly reduced from pre-development conditions because of several factors. Typically, pre-development wooded areas discharge a relatively high concentration of suspended and

dissolved sediment. The pre-development loading rates for these constituents are similar in value to post-development rates as can be seen from the loading table. Post-development sites have soil surfaces that are generally stabilized with lawn and landscaping areas that prevent the movement of sediment through the site. In addition, the modern stormwater facilities remove any suspended and dissolved sediment throughout the site, as compared to no discharge controls under pre-development conditions.

In conformance with current regulatory requirements, the pollutant loadings for total phosphorous and total nitrogen (TN) in treated stormwater from the site decrease when compared to post-development conditions without stormwater controls. Total phosphorous is reduced by 66% and total nitrogen is reduced by 70%. However, the post-development values for these two constituents slightly increase as compared to pre-development values. The TP is calculated to increase by 4.9 lbs/yr and TN has been calculated to increase by 11.2 lbs/yr. These values would seem to greatly differ from pre-development values. However, a comparison to the overall watershed for Silver Lake indicates that the minor increase expected from the post-development site is negligible.

The Silver Lake watershed area is comprised of approximately 7,600 acres. The appended calculations were performed to estimate loading to Silver Lake from its associated watershed utilizing a conservative approach that no development has occurred within the watershed area, it was assumed that no development has occurred within the Silver Lake watershed. This assumption allows the annual loading values to be the lowest possible for purposes of analysis. When compared to the overall Silver Lake watershed, the slight increase for total phosphorous amounts to a 0.59% increase. Calculated Nitrogen values show a slight increase of 0.06%, an immeasurable amount. As compared to the overall drainage area pollutant loadings, the slight increase of these constituents will not significantly impact Silver Lake.

Overall, the project site is proposed to be developed to exceed current requirements for treatment of stormwater discharges. The current regulations only specify that reductions in TSS and TP be met as compared to post-development conditions without stormwater controls. The project site meets both requirements and also provides for treatment of dissolved solids and metals. The additional loadings of TP and TN from this project are very minor in comparison to the existing total pollutant loading of the Silver Lake watershed. While an analytical evaluation of the conditions of Silver Lake and its extensive watershed is beyond the scope of this EIS, blue-green algae blooms within the lake would be expected to require conditions of far greater nutrient loading in stagnant, warm water than would result from the Golden

Triangle project. This project and any other site developments within the Silver Lake watershed must have individual stormwater pollution prevention plans and must also comply with NYSDEC regulations for stormwater discharges, that include 80% TSS and 40% TP removal rates.

Pre-Development Pollutant Loading

Project Site A and B

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr				Annual Loads lb/yr								
			TSS	TDS	TP	TN	TSS	TDS	TP	TN	Cu	Zn			
Forest/Wooded Areas	C/D	12.3	51.0	415.0	0.1	2.5	0.0	0.0	0.0	625.3	5087.9	1.3	30.7	0.0	0.0
Totals		12.3								625.3	5087.9	1.3	30.7	0.0	0.0

Totals

TSS = Total Suspended Solids
 TP = Total Phosphorus
 TN = Total Nitrogen
 Cu and Zn = Total Metals
 TDS = Total Dissolved Solids

Pre-Development Pollutant Loading

Silver Lake Watershed

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr				Annual Loads lb/yr							
			TSS	TDS	TP	TN	TSS	TDS	TP	TN	Cu	Zn		
Forest/Wooded Areas	C/D	7600.0	51.0	415.0	0.1	2.5	387600	3154000	836	19000	0	0		
Totals		7600.0					387600	3154000	836	19000	0	0		

Totals 7600.0

TSS = Total Suspended Solids
 TP = Total Phosphorus
 TN = Total Nitrogen
 Cu and Zn = Total Metals
 TDS = Total Dissolved Solids

Post-Development Pollutant Loading with SMP's

Silver Lake Watershed

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr				Annual Loads lb/yr							
			TSS	TDS	TP	TN	TSS	TDS	TP	TN	Cu	Zn		
Forest/Wooded Areas	C/D	7587.7	51.0	415.0	0.1	2.5	386972.7	3148895.5	834.6	18969.3	0.0	0.0		
Developed Site		12.3	70.0	144.0	1.5	11.7	60.0	588.0	6.2	41.9	0.0	0.1		
Totals		7600.0					387032.7	3149483.5	840.8	19011.2	0.0	0.10		

Totals 7600.0

Total Watershed Increase (Value in %)

-0.1 -0.1 0.580 0.059 0 0.00

Post-Development Pollutant Loading (with SMP's)

Area A-1

Land Use	Hydrologic Soil Group	Acreage	Annual Loads lb/ac/yr						Removal Efficiencies % Removal						Annual Loads lb/yr											
			TSS		TDS		TP		TN		Cu		Zn		TSS		TDS		TP		TN		Cu		Zn	
Residential Townhouse Development Medium Density	C/D	1.9	133.0	273.6	2.9	22.2	0.1	0.3	85.0	50.0	40.0	84.0	70.0	70.0	20.0	136.8	1.7	3.6	0.097							
Totals		1.9	133.0	273.6	2.9	22.2	0.1	0.3							20.0	136.8	1.7	3.6	0.097							

Area A-2

Land Use	Hydrologic Soil Group	Acreage	Annual Loads lb/ac/yr						Removal Efficiencies % Removal						Annual Loads lb/yr											
			TSS		TDS		TP		TN		Cu		Zn		TSS		TDS		TP		TN		Cu		Zn	
Residential Townhouse Development Medium Density	C/D	2.8	196.0	403.2	4.2	32.8	0.1	0.5	97.0	75.0	70.0	68.0	89.0	89.0	5.9	100.8	1.3	10.5	0.05							
Totals		2.8	196.0	403.2	4.2	32.8	0.1	0.5							5.9	100.8	1.3	10.5	0.05							

Area A-3

Land Use	Hydrologic Soil Group	Acreage	Annual Loads lb/ac/yr						Removal Efficiencies % Removal						Annual Loads lb/yr											
			TSS		TDS		TP		TN		Cu		Zn		TSS		TDS		TP		TN		Cu		Zn	
Residential Townhouse Development Medium Density	C/D	0.9	64.4	132.5	1.4	10.8	0.0	0.2	97.0	75.0	84.0	64.0	91.0	91.0	1.9	33.1	0.2	3.9	0.0							
Totals		0.9	64.4	132.5	1.4	10.8	0.0	0.2							1.9	33.1	0.2	3.9	0.0							

Area A-4

Land Use	Hydrologic Soil Group	Acreage	Annual Loads lb/ac/yr						Removal Efficiencies % Removal						Annual Loads lb/yr											
			TSS		TDS		TP		TN		Cu		Zn		TSS		TDS		TP		TN		Cu		Zn	
Residential Townhouse Development Medium Density	C/D	0.9	65.8	135.4	1.4	11.0	0.0	0.2	85.0	50.0	40.0	84.0	70.0	70.0	9.9	67.7	0.8	1.8	0.0							
Totals		0.9	65.8	135.4	1.4	11.0	0.0	0.2							9.9	67.7	0.8	1.8	0.0							

Area A-5

Land Use	Hydrologic Soil Group	Acreage	Annual Loads lb/ac/yr						Removal Efficiencies % Removal						Annual Loads lb/yr											
			TSS		TDS		TP		TN		Cu		Zn		TSS		TDS		TP		TN		Cu		Zn	
Residential Townhouse Development Medium Density	C/D	2.6	182.0	374.4	3.9	30.4	0.1	0.4	97.0	75.0	84.0	64.0	91.0	91.0	5.5	93.6	0.6	11.0	0.0							
Totals		2.6	182.0	374.4	3.9	30.4	0.1	0.4							5.5	93.6	0.6	11.0	0.0							

(SMP Pollutant Removal - Table A.4 - NYS Stormwater Design Manual)

Watershed	SMP	TSS	TP	TN	Cu & Zn	TDS
A-1	Dry Swale	0.85	0.4	0.5	0.7	0.5
A-2	Wet Pond	0.8	0.51	0.35	0.62	0.5
A-3	Bioretention	0.85	0.6	0.4	0.7	0.5
A-3	Sand Filter	0.85	0.6	0.4	0.7	0.5
A-4	Dry Swale	0.85	0.4	0.5	0.7	0.5
A-5	Bioretention	0.85	0.6	0.4	0.7	0.5
A-5	Sand Filter	0.42	0.3	0.2	0.35	0.25
A-6	Dry Swale	0.85	0.4	0.5	0.7	0.5
A-7	Bioretention	0.85	0.6	0.4	0.7	0.5
A-7	Sand Filter	0.42	0.3	0.2	0.35	0.25
A-8	Bioretention	0.85	0.6	0.4	0.7	0.5
B-2	Dry Swale	0.85	0.4	0.5	0.7	0.5

POLLUTANT REMOVALS IN SERIES		BIORETENTION & SAND FILTERS	
TSS	85	TSS	85
WET POND	85	BIORETENTION	85
DRY SWALE	0.9775	SAND FILTER	0.9775
BOTH		BOTH	
TP	60	TP	60
WET POND	60	BIORETENTION	60
DRY SWALE	0.84	SAND FILTER	0.84
BOTH		BOTH	
TN	40	TN	40
WET POND	40	BIORETENTION	40
DRY SWALE	0.64	SAND FILTER	0.64
BOTH		BOTH	
Cu and Zn	70	Cu and Zn	70
WET POND	70	BIORETENTION	70
DRY SWALE	0.91	SAND FILTER	0.91
BOTH		BOTH	
TSS	50	TSS	50
WET POND	50	BIORETENTION	50
DRY SWALE	0.75	SAND FILTER	0.75
BOTH		BOTH	

POLLUTANT REMOVALS IN SERIES		WET POND AND DRY SWALE	
TSS	80	TSS	80
WET POND	85	WET POND	85
DRY SWALE	0.97	DRY SWALE	0.97
BOTH		BOTH	
TP	50	TP	50
WET POND	60	WET POND	60
DRY SWALE	40	DRY SWALE	40
BOTH		BOTH	
TN	35	TN	35
WET POND	50	WET POND	50
DRY SWALE	0.7	DRY SWALE	0.7
BOTH		BOTH	
Cu and Zn	62	Cu and Zn	62
WET POND	70	WET POND	70
DRY SWALE	0.9	DRY SWALE	0.9
BOTH		BOTH	
TSS	50	TSS	50
WET POND	50	WET POND	50
DRY SWALE	0.75	DRY SWALE	0.75
BOTH		BOTH	

Post-Development Pollutant Loading (without SMP's)

Area A-1

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr						Annual Loads lb/yr					
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	1.9	70	144	1.5	11.7	0.047	0.17	133.0	273.6	2.9	22.2	0.1	0.3
Totals		1.9							133.0	273.6	2.9	22.2	0.1	0.3

Area A-2

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr						Annual Loads lb/yr					
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	2.8	70	144	1.5	11.7	0.047	0.17	196.0	403.2	4.2	32.8	0.1	0.5
Totals		2.8							196.0	403.2	4.2	32.8	0.1	0.5

Post-Development Pollutant Loading (without SMP's) (cont'd)

Area A-3

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr						Annual Loads lb/yr					
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	0.92	70	144	1.5	11.7	0.047	0.17	64.4	132.5	1.4	10.8	0.04	0.2
Totals		0.92							64.4	132.5	1.4	10.8	0.04	0.2

Area A-4

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr						Annual Loads lb/yr					
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	0.94	70	144	1.5	11.7	0.047	0.17	65.8	135.4	1.4	11.0	0.04	0.2
Totals		0.94							65.8	135.4	1.4	11.0	0.04	0.2

Area A-5

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/ac/yr						Annual Loads lb/yr					
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	2.6	70	144	1.5	11.7	0.047	0.17	182.0	374.4	3.9	30.4	0.1	0.4
Totals		2.6							182.0	374.4	3.9	30.4	0.1	0.4

Post-Development Pollutant Loading (without SMP's) Cont.
Area A-6

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/acre/yr					Annual Loads lb/yr						
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	0.5	70.0	144.0	1.5	11.7	0.0	0.2	35.0	72.0	0.8	5.9	0.0	0.1
Totals		0.5						35.0	72.0	0.8	5.9	0.0	0.1	

Area A-7

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/acre/yr					Annual Loads lb/yr						
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	1.9	70.0	144.0	1.5	11.7	0.0	0.2	130.2	267.8	2.8	21.8	0.1	0.3
Totals		1.9						130.2	267.8	2.8	21.8	0.1	0.3	

Area A-8

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/acre/yr					Annual Loads lb/yr						
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	0.2	70.0	144.0	1.5	11.7	0.0	0.2	15.4	31.7	0.3	2.6	0.0	0.0
Totals		0.2						15.4	31.7	0.3	2.6	0.0	0.0	

Area B-1

Land Use	Hydrologic Soil Group	Acreage	Annual Loading Rates lb/acre/yr					Annual Loads lb/yr						
			TSS	TDS	TP	TN	Cu	Zn	TSS	TDS	TP	TN	Cu	Zn
Residential Townhouse Development Medium Density	C/D	0.5	70.0	144.0	1.5	11.7	0.0	0.2	36.4	74.9	0.8	6.1	0.0	0.1
Totals		0.5						36.4	74.9	0.8	6.1	0.0	0.1	

Totals: 12.3

858.2 1765.4 18.4 143.4 0.6 2.1

TSS = Total Suspended Solids
TP = Total Phosphorus
TN = Total Nitrogen
Cu and Zn = Total Metals
TDS = Total Dissolved Solids

Section 4.8 Downstream Analysis

Overbank, and extreme flood requirements may be waived based on the results of a downstream analysis. In addition, such an analysis for overbank and extreme flood control is recommended for larger sites (i.e., greater than 50 acres) to size facilities in the context of a larger watershed. The analysis will help ensure that storage provided at a site is appropriate when combined with upstream and downstream flows. For example, detention at a site may in some instances exacerbate flooding problems within a watershed. This section provides brief guidance for conducting this analysis, including the specific points along the downstream channel to be evaluated and minimum elements to be included in the analysis.

Downstream analysis can be conducted using the 10% rule. That is, the analysis should extend from the point of discharge downstream to the point on the stream where the site represents 10% of the total drainage area. For example, the analysis points for a 10-acre would include points on the stream from the points of discharge to the nearest downstream point with a drainage area of 100 acres. The required elements of the downstream analysis are described below.

- Compute pre-development and post-development peak flows and velocities for design storms (e.g., 10-year and 100-year), at all downstream confluences with first order or higher streams up to and including the point where the 10% rule is met. These analyses should include scenarios both with and without stormwater treatment practices in place, where applicable.
- Evaluate hydrologic and hydraulic effects of all culverts and/or obstructions within the downstream channel.
- Assess water surface elevations to determine if an increase in water surface elevations will impact existing buildings and other structures.

The design, or exemption, at a site level can be approved if both of the following criteria are met:

- Peak flow rates increase by less than 5% of the pre-developed condition for the design storm (e.g., 10-year or 100-year)
- No downstream structures or buildings are impacted.

Table: Constant concentrations

Land Use Category	BOD	COD	TSS	TDS	TP	DP	TKN	NO ₃ /NO ₂	Pb	Cu	Zn	Cd
Forest/rural open	3	27	51	415	0.11	0.03	0.94	0.8	0	0	0	0
Urban	3	27	51	415	0.11	0.03	0.94	0.8	0.014	0	0.04	0.001
Agricultural pasture	3	53	145	415	0.37	0.09	1.92	4.08	0	0	0	0
Low-density residential	38	124	70	144	0.52	0.27	3.32	1.83	0.057	0.026	0.161	0.004
Medium-density residential	38	124	70	144	0.52	0.27	3.32	1.83	0.18	0.047	0.176	0.004
High-density residential	14	79	57	189	0.24	0.08	1.17	2.12	0.041	0.033	0.218	0.003
Commercial	21	80	77	294	0.33	0.17	1.74	1.23	0.049	0.037	0.156	0.003
Industrial	24	85	149	202	0.32	0.11	2.08	1.89	0.072	0.058	0.671	0.005
Highways	24	103	141	294	0.43	0.22	1.82	0.83	0.049	0.037	0.156	0.003
Water/wetlands	4	6	6	12	0.08	0.04	0.79	0.59	0.011	0.007	0.003	0.001

Adapted from NURP (1983), Homer et al. (1994), and Cave et al. (1994)

BOD Biochemical Oxygen Demand
 COD Chemical Oxygen Demand
 TSS Total Suspended Solids
 TDS Total Dissolved Solids
 TP Total Phosphorus
 DP Dissolved Phosphorus
 All units in milligrams per liter (mg/L).

TKN
 NO₃/NO₂
 Pb
 Cu
 Zn
 Cd

Total Kjeldahl Nitrogen
 Nitrates/Nitrites
 Lead
 Copper
 Zinc
 Cadmium

Source: Terrene Institute, 1996

Storm pollutant export under pre-development and post-development conditions is determined by solving the following equation separately for each pollutant of concern:

$$L = [(P) (P_f) (R_v) 1.2] (C) (A) \quad (2.72)$$

L = storm pollutant export (in pounds).

P = rainfall depth (inches) over the desired time interval for which pollutant loading is to be estimated.

P_f = factor that corrects P for storms

C = flow-weighted mean concentration of the pollutant in urban runoff (mg/l). (Flow-weighted C values for selected pollutants can be obtained from Table by matching a specific land use (columns) with a pollutant of concern (rows)).

A = area of the development site or of sub-watershed in acres by sub-catchment.

1.2 and 0.72 in the equation are unit

RAINFALL LIST BY COUNTY

The frequency values listed below are average values for the County. Please check these against the maps on Figure 2-1 thru 2-3 for your county. In certain areas of the county jobs may require higher or lower rainfall values.

	RAINFALL FOR EACH FREQUENCY							Average Annual Rainfall
	1YR	2YR	5YR	10YR	25YR	50YR	100YR	
ALBANY	2.4	2.9	3.7	4.5	4.9	5.5	7.0	35.7
ALLEGANY	2.2	2.6	3.2	3.8	4.3	4.8	5.3	37.6
BRONX	2.7	3.5	4.5	5.0	6.0	7.0	7.5	44.1
BROOME	2.4	2.8	3.5	4.2	4.8	5.3	6.2	37.8
CATTARAUGUS	2.2	2.5	3.2	3.7	4.2	4.7	5.2	44.1
CAYUGA	2.2	2.5	3.2	3.8	4.4	4.8	5.3	31.3
CHAUTAUQUA	2.1	2.5	3.1	3.6	4.1	4.6	4.9	52.1
CHEMUNG	2.3	2.7	3.4	3.9	4.6	5.0	5.6	34.3
CHENANGO	2.3	2.8	3.4	4.0	4.8	5.0	6.0	41.5
CLINTON	2.0	2.5	3.1	3.5	4.0	4.5	4.9	31.8
COLUMBIA	2.5	3.0	4.0	4.7	5.5	6.0	7.8	39.9
CORTLAND	2.3	2.7	3.4	3.9	4.6	4.9	5.6	43.2
DELAWARE	2.5	2.9	4.0	4.5	5.0	5.5	7.9	45.0
DUTCHESS	2.8	3.5	4.5	5.0	6.0	7.0	8.0	40.2
ERIE	2.1	2.5	3.1	3.6	4.0	4.5	4.9	44.1
ESSEX	2.1	2.5	3.2	3.6	4.2	4.6	5.1	38.2
FRANKLIN	2.0	2.5	3.0	3.5	4.0	4.5	4.8	47.3
FULTON	2.3	2.6	3.4	3.9	4.6	4.9	5.5	40.8
GENESEE	2.1	2.5	3.1	3.6	4.1	4.6	4.9	36.8
GREENE	3.0	3.0	4.5	5.0	6.0	7.0	8.0	42.4
HAMILTON	2.2	2.5	3.2	3.7	4.3	4.7	5.4	44.0
HERKIMER	2.2	2.5	3.2	3.7	4.4	4.7	5.5	46.4
JEFFERSON	2.1	2.5	3.0	3.5	4.0	4.5	4.7	38.7
KINGS	2.7	3.5	4.5	5.0	6.0	7.0	7.5	44.1
LEWIS	2.3	2.5	3.1	3.6	4.2	4.5	4.8	43.3
LIVINGSTON	2.2	2.5	3.2	3.7	4.2	4.7	5.0	33.7
MADISON	2.3	2.6	3.3	3.8	4.6	4.9	5.5	40.3
MANHATTAN	2.7	3.5	4.5	5.0	6.0	6.5	7.5	44.1
MONROE	2.2	2.5	3.1	3.6	4.1	4.6	4.9	30.9
MONTGOMERY	2.4	2.7	3.4	3.9	4.7	5.0	5.7	36.2
NASSAU	2.7	3.5	4.5	5.0	6.0	7.0	7.5	44.1
NIAGARA	2.1	2.5	3.0	3.5	4.0	4.5	4.8	39.9
ONEIDA	2.3	2.5	3.2	3.8	4.5	4.8	5.4	49.4
ONONDAGA	2.2	2.6	3.2	3.8	4.5	4.8	5.2	40.5
ONTARIO	2.2	2.5	3.2	3.7	4.3	4.7	5.0	33.4
ORANGE	2.9	3.5	4.5	5.5	6.5	7.0	8.0	48.0
ORLEANS	2.1	2.5	3.0	3.5	4.0	4.5	4.8	39.4

Appendix A: The Simple Method to Calculate Urban Stormwater Loads

This appendix presents data and methodologies for using the Simple Method (Schueler, 1987) to estimate pollutant load from a site or drainage area. This appendix is meant for planning purposes only, and should not be used for SMP design.

The Simple Method estimates stormwater runoff pollutant loads for urban areas. The technique requires a modest amount of information, including the subwatershed drainage area and impervious cover, stormwater runoff pollutant concentrations, and annual precipitation. With the Simple Method, the investigator can either break up land use into specific areas, such as residential, commercial, industrial, and roadway and calculate annual pollutant loads for each type of land, or utilize more generalized pollutant values for urban runoff. It is also important to note that these values may vary depending on other variables such as the age of development.

The Simple Method estimates pollutant loads for chemical constituents as a product of annual runoff volume and pollutant concentration, as:

$$L = 0.226 * R * C * A$$

Where: L = Annual load (lbs)
 R = Annual runoff (inches)
 C = Pollutant concentration (mg/l)
 A = Area (acres)
 0.226 = Unit conversion factor

For bacteria, the equation is slightly different, to account for the differences in units. The modified equation for bacteria is:

$$L = 103 * R * C * A$$

Where: L = Annual load (Billion Colonies)
 R = Annual runoff (inches)
 C = Bacteria concentration (1,000/ ml)
 A = Area (acres)
 103 = Unit conversion factor

A.1 Pollutant Concentrations

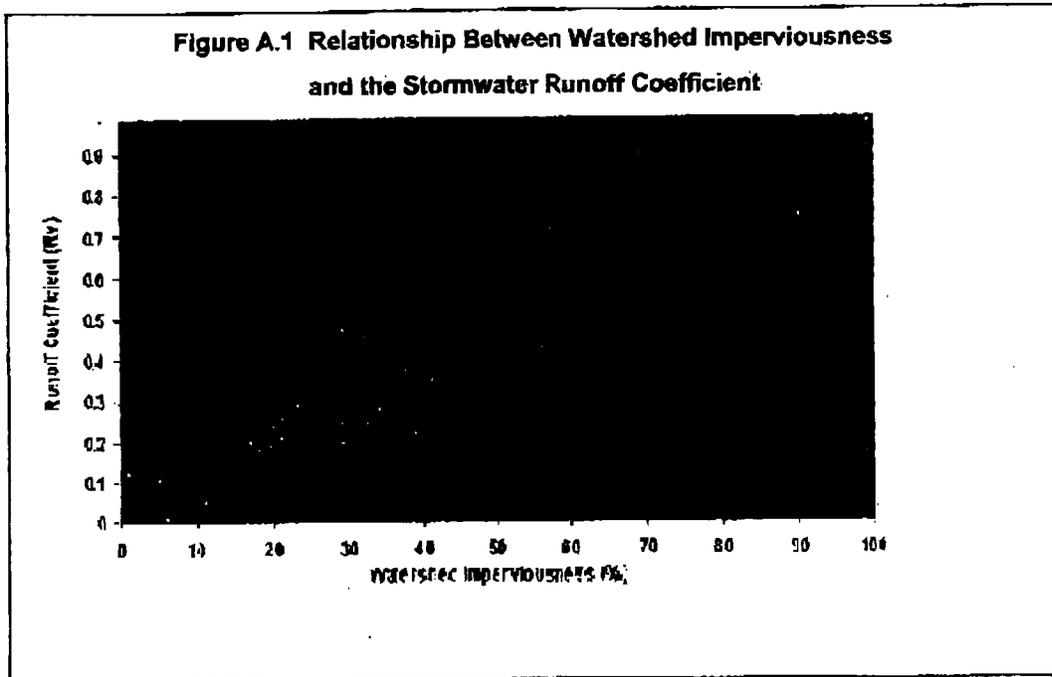
Stormwater pollutant concentrations can be estimated from local or regional data, or from national data sources. Table A.1 presents typical concentration data for pollutants in urban stormwater.

Constituent	Units	Urban Runoff
TSS	mg/l	54.5 ¹
TP	mg/l	0.26 ¹
TN	mg/l	2.00 ¹
Cu	ug/l	11.1 ¹
Pb	ug/l	50.7 ¹
Zn	ug/l	129 ¹
F Coli	1,000 col/ ml	1.5 ²

Source:
 1: Pooled NURP/USGS (Smullen and Cave, 1998)
 2: Schueler (1999)

In addition, some source areas appear to be particularly important for some pollutants. Table A.2 summarizes these data for several key source areas. It is important to note that, because the Simple Method computes runoff based on an impervious area fraction, it cannot be easily used to isolate pervious sources, such as lawns. However, a user can evaluate particular hotspots, such as auto recyclers, separately. In addition, a composite runoff concentration can be developed based on the fraction of lawn, driveway, and roof on a residential site, for example.

Constituent	TSS ¹	TP ²	TN ³	F Coli ¹	Cu ¹	Pb ¹	Zn ¹
	mg/l	mg/L	mg/l	1,000 col/ ml	ug/l	ug/l	ug/l
Resid Roof	19	0.11	1.5	0.26	20	21	312
Comm Roof	9	0.14	2.1	1.1	7	17	256
Indust Roof	17	-	-	5.8	62	43	1,390
C/R Parking	27	0.15	1.9	1.8	51	28	139
Indust Parking	228	-	-	2.7	34	85	224
Res Street	172	0.55	1.4	37	25	51	173
Comm Street	468	-	-	12	73	170	450
Rural Highway	51	-	22	-	22	80	80
Urban Highway	142	0.32	3.0	-	54	400	329
Lawns	602	2.1	9.1	24	17	17	50
Landscaping	37	-	-	94	94	29	263
Driveway	173	0.56	2.1	17	17	-	107
Gas Station	31	-	-	-	88	80	290
Auto Recycler	335	-	-	-	103	182	520
Heavy Industrial	124	-	-	-	148	290	1600
1: Claytor and Schueler (1996)							
2: Average of Steuer et al. (1997),Bannerman (1993) and Waschbusch (2000)							
3: Steuer et al. (1997)							



A.2. Annual Runoff

The Simple Method calculates annual runoff as a product of annual runoff volume, and a runoff coefficient (Rv). Runoff volume is calculated as:

$$R = P * P_j * Rv$$

- Where:
- R = Annual runoff (inches)
 - P = Annual rainfall (inches)
 - P_j = Fraction of annual rainfall events that produce runoff (usually 0.9)
 - Rv = Runoff coefficient

In the Simple Method, the runoff coefficient is calculated based on impervious cover in the subwatershed. This relationship is shown in Figure A.1. Although there is some scatter in the data, watershed imperviousness does appear to be a reasonable predictor of Rv.

The following equation represents the best fit line the dataset (N=47, R²=0.71).

$$Rv = 0.05 + 0.9Ia$$

- Where: Ia = Impervious fraction

A.3 Impervious Cover Data

The Simple Method uses different impervious cover values for separate land uses within a subwatershed. Representative impervious cover data, are presented in Table A.3. These numbers are derived from a recent study conducted by the Center for Watershed Protection under a grant from the U.S. Environmental Protection Agency to update impervious cover estimates for a variety of land uses. (Cappiella and Brown, 2001). In addition, some jurisdictions may have detailed impervious cover information if they maintain a detailed land use/land cover GIS database.

Land Use Category	Mean Impervious Cover
Agriculture	2
Open Urban Land*	9
2 Acre Lot Residential	11
1 Acre Lot Residential	14
1/2 Acre Lot Residential	21
1/4 Acre Lot Residential	28
1/8 Acre Lot Residential	33
Townhome Residential	41
Multifamily Residential	44
Institutional**	31-38%
Light Industrial	50-56%
Commercial	70-74%
* Open urban land includes developed park land, recreation areas, golf courses, and cemeteries.	
** Institutional is defined as places of worship, schools, hospitals, government offices, and police and fire stations	

A.4 Limitations of the Simple Method

The Simple Method should provide reasonable estimates of changes in pollutant export resulting from urban development activities. However, several caveats should be kept in mind when applying this method.

The Simple Method is most appropriate for assessing and comparing the relative stormflow pollutant load changes of different land use and stormwater management scenarios. The Simple Method provides estimates of storm pollutant export that are probably close to the "true" but unknown value for a development site, catchment, or subwatershed. However, it is very important not to over emphasize the precision of the results obtained. For example, it would be inappropriate to use the Simple Method to evaluate relatively similar development scenarios (e.g., 34.3% versus 36.9% Impervious cover). The simple method provides a general planning estimate of likely storm pollutant export from areas at the scale of a development site, catchment or subwatershed. More sophisticated modeling may be needed to analyze larger and more complex drainages.

In addition, the Simple Method only estimates pollutant loads generated during storm events. It does not consider pollutants associated with baseflow volume. Typically, baseflow is negligible or non-existent at the scale of a single development site, and can be safely neglected, unless wastewater sources such as illicit connections and wastewater treatment plants are significant. However, catchments and subwatersheds do generate baseflow volume. Pollutant loads in baseflow are generally low and can seldom be distinguished from natural background levels (NVPDC, 1980). Consequently, baseflow pollutant loads normally constitute only a small fraction of the total pollutant load delivered from an urban area. Nevertheless, it is important to remember that the load estimates refer only to storm event derived loads and should not be confused with the total pollutant load from an area. This is particularly important when the development density of an area is low. For example, in a large low density residential subwatershed (Imp. Cover < 5%), as much as 75% of the annual runoff volume may occur as baseflow. In such a case, the annual baseflow nutrient load may be equivalent to the annual stormflow nutrient load.

A.5 SMP Pollutant Removal

The removal efficiencies of various SMP practices also help determine final annual pollutant loads. Table A.4 provides estimates of the average pollutant removal efficiency of the five SMP categories.

	TSS	TP	TN	Metals ¹	Bacteria
Wet Ponds	80	50 (51)	35 (33)	60 (62)	70
Stormwater Wetlands	80 ² (76)	50 (49)	30	40 (42)	80 (78)
Filtering Practices	85 (86)	60 (59)	40 (38)	70 (69)	35 (37)
Infiltration Practices⁴	90 ³ (95)	70	50 (51)	90 ³ (99)	90 ⁴
Water Quality Swales	85 (84)	40 (39)	50 ³ (84)	70	0 (-25) ⁶

1. Average of zinc and copper. Only zinc for infiltration
2. Many wetland practices in the database were poorly designed, and we consequently adjusted sediment removal upward.
3. It is assumed that no practice is greater than 90% efficient.
4. Data inferred from sediment removal.
5. Actual data is based on only two highly performing practices.
6. Assume 0 rather than a negative removal.

Note: Data in parentheses represent median pollutant removal data reported in the *National Pollutant Removal Database - Revised Edition* (Winer, 2000). These data were adjusted for convenience and to reflect biases in the data.

These efficiencies represent ideal pollutant removal rates that cannot be achieved at all sites, or at a watershed level. Typically, they need to be “discounted” to account for site constraints, and other factors that reduce practice efficiency. For example, the removal rate should be adjusted to reflect the fraction of runoff captured by a practice on an annual basis (90% if this guidance is followed). For more detail on how to apply these discounts, consult Caraco (2001).

One particularly important consideration is how to account for practices applied in series (e.g., two ponds applied in sequence). If the volume within the practices adds up to the total water quality volume, they are assumed to act as a single practice with that volume. Otherwise, total pollutant removal should be determined by the following equation:

$$R = L [(E_1) + (1 - E_1)E_2 + (1 - (E_1) + (1 - E_1)E_2)E_3 + \dots]$$

Where:

R = Pollutant Removal (lbs)

L = Annual Load from Simple Method (lbs.)

E_i = Efficiency of the ith practice in a series

Another adjustment can be made to these removals to account for loss of effectiveness and “irreducible concentrations.” Evidence suggests that, at low concentrations, SMPs can no longer remove pollutants.

Table A.5 depicts typical outflow concentrations for various SMPs. Another simplified way to account for this phenomenon is to reduce the efficiency of a second or third practice in a series. For example, the removal efficiency could be cut in half to reflect inability to remove fine particles.

	TSS	TP	TN	Cu	Zn
Wet Ponds	17	0.11	1.3	5.0	30
Wetlands	22	0.20	1.7	7.0	31
Filtering Practices	11	0.10	1.12	10	21
Infiltration Practices	17 ²	0.05 ²	3.8 ²	4.8 ²	39 ²
Open Channel Practices	14	0.19	1.12	10	53
1. Units for Zn and Cu are micrograms per liter					
2. Data based on fewer than five data points					

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Appendix E

Stormwater Pollution
Prevention Plan



**COVERED BRIDGE AT
GOLDEN TRIANGLE**
Town of Wallkill, Orange County NY

STORMWATER POLLUTION PREVENTION PLAN

PREPARED BY
LANC & TULLY P.C.

DECEMBER 2004
Revised: March 2005

LANC & TULLY

ENGINEERING AND SURVEYING, P.C.

**STORMWATER POLLUTION PREVENTION PLAN
COVERED BRIDGE AT GOLDEN TRIANGLE
RESIDENTIAL TOWNHOUSE DEVELOPMENT
TOWN OF WALLKILL, ORANGE COUNTY, NEW YORK**

**DECEMBER 16, 2004
REVISED: MARCH 7, 2005**

I. Introduction

The project Covered Bridge at Golden Triangle is a proposed 90 unit residential townhouse development located on several existing parcels in the Town of Wallkill totaling 92.78 acres in size. The site is located on Silver Lake Scotchtown Road, adjacent to N.Y.S. Route 17 located along the Northern Property boundary. (See Appendix A for Site location maps). The site is located in a planned interchange development zone (PID), which allows multiple family dwelling units. The proposed project is to subdivide and develop a 19.24 acre portion of the site for multiple family residential housing. The proposed residences are townhouse units having two or three bedrooms to be served by municipal water and sewer services provided by the Town of Wallkill. The project site can generally be described as consisting of woodlands with rolling topography. Drainage discharges off of the site by flowing in a southerly direction discharging into two large wetland areas and flowing a stream network to the Masonic Creek at the intersection of Silver Lake Scotchtown Road. Downstream from the project site lies Silver Lake, which is collects the runoff from the Masonic Creek and its associated watershed. This watershed encompasses approximately 7,600 acres and approximately 800 acres in the immediate vicinity of the project (See Appendix A). The project currently proposes the development of approximately 19.48 acres of the possible 92.78 acres.

II. Current Regulations

Stormwater runoff and its subsequent impact to receiving water bodies led Federal, State and local officials to set new standards on stormwater discharge to attempt to restore stream water quality. Through years of study, certain criteria were identified to be reducing water quality. These include sediment, nutrients (phosphorus and nitrogen), organic carbon, bacteria, and hydro-carbons and trace metals only to name but a few. According to 40 CFR, Part 122 prohibits point source discharges of stormwater to waters of the United States without a permit issued under the National Pollutant Discharge Elimination System (NPDES). As New York State is approved by the EPA to administer the program, the SPDES regulations are currently in effect. Current regulation require that five days prior to construction a Notice of Intent (NOI) form be submitted to the New York State Department of Environmental Conservation Bureau of Water Permits located at 625 Broadway, Albany, New York (see Appendix I). This NOI requires, if appropriate, a Stormwater Pollution Plan be developed. This consists of water quality control, water quantity control and erosion and sediment plan.

The SPDES regulations basically outline four distinct criteria to be addressed in the development of the Stormwater Pollution Prevention Plan. Three of the four relate to stormwater quantity (specifically channel protection, over bank flooding and extreme storm events), and the fourth addresses water quality.

III. Methodology

The analysis presented in this report was developed by use of the Haestad Methods computer software program PondPack. PondPack is based upon and implements the Soil Conservation Service Technical Release 55 (SCS TR-55) "Urban Hydrology for Small Watersheds Methodology" for computing CN, Tc, Runoff values and hydrographs for the development of drainage and hydraulic calculations. For purposes of this report and in accordance with the regulations set forth by the New York State Department of Conservation as part of a SPDES Permit for Stormwater Discharges From Construction Activities, the 1(Channel Protection)-, 10-(Over bank Flood), and 100-year (Extreme Storm) storm events were analyzed. This analysis is specific for this site and is based on current and proposed land cover, underlying soil types, weighted runoff coefficients, theoretical flow paths, and rain events. These were then input into the computer model, which then developed hydrographs for both pre- and post-development conditions and this information is shown in Appendix C.

IV. Water Quantity

The New York State Department of Environmental Conservation has selected three criteria as part of the stormwater regulations. They are summarized as follows:

Channel Protection: 24-hour extended detention of post-developed one-year, 24-hour storm event

Over bank Flood: Control the peak discharge from the 10-year storm to 10-year pre-development rates

Extreme Storm: Control the peak discharge from 100-year storm to 100-year pre-development rates

A waiver is requested at this time for the over bank and extreme flood requirements as documented within the NYSDEC Stormwater Management Design Manual Section 4.8 "Downstream Analysis". The following is a brief excerpt from the manual for clarification.

Over bank, and extreme flood requirements may be waived based on the results of a downstream analysis. The analysis will help ensure that storage provided at a site is appropriate when combined with upstream and downstream flows. This analysis is conducted using the 10% rule. That is, the analysis should extend from the point of discharge downstream to the point on the stream where the site represents 10% of the total drainage area. The required elements of the downstream analysis are as follows:

- Computation of pre- and post-development peak flows and velocities for design storms (e.g., 10-year and 100-year), at all downstream confluences with first order or higher streams up to and including the point where the 10% rule is met. These analyses should include scenarios both with and without stormwater treatment practices in place, where applicable.

- Evaluation of hydrologic and hydraulic effects of all culverts and/or obstructions within the downstream channel.
- Assessment of downstream water surface elevations to determine potential impacts to existing buildings and other structures.

In accordance with these requirements, a drainage analysis has been performed for the site and surrounding area. The analysis utilized the 10% rule in determining the overall site impact in conjunction with the surrounding area to the Masonic Creek and Silver Lake (See Appendix A). Also featured within this analysis is a comparison of peak flow rates between a detained and undetained site condition as further described below.

The peak flow rates for both the pre- and post-development analysis were developed using the TR-55 Method, developed by the Soil Conservation Service and the U.S. Department of Agriculture, published in their "Urban Hydrology for Small Watersheds". Haestad Methods' PondPack software package, which makes use of the TR-55 Method, was employed to model the site hydrology and determine pre- and post-development hydraulic rates of runoff (See Appendix C). Described below are all assumptions made within each model and the results of the modeling computations in compliance with the NYSDEC regulations for a downstream analysis.

Pre-development Conditions

The drainage area of the site and associated watershed area encompassing the downstream drainage area limits has been determined using a combination of the topographic survey completed for the subdivision plan and the Middletown U.S.G.S. Quadrangle map. The soil boundaries and types shown are based upon the Orange County Soil Survey as documented by the Soil Conservation Service. All of the soil types within the boundaries of the drainage area are Hydrologic Group C & D soils. Utilizing the 10% rule, a drainage area of 193.4 acres was delineated, consisting of mostly ¼ acre residential developments, commercial business areas, and wooded areas and other contributing impervious surfaces. The entire drainage area discharges to the Masonic Creek, which directly inlets to Silver Lake via two large arch culverts under Bert Crawford Road located just south of the proposed project development. This watershed area is part of the Silver Lake watershed, which encompasses approximately 7,600 acres.

In determining site runoff volumes along the study limits, contributing areas of various soil types and ground covers were determined for each drainage area and documented. Based upon this data, a cumulative Curve Number (CN) was determined that relates the rainfall to the runoff volume over the drainage areas. (See Appendix C) Peak flow rates can then be determined utilizing travel paths that are the most hydraulically distant to the study point of each drainage area. Utilizing NYSDEC Stormwater Management Guidelines and TR-55 Methodologies, 150 feet of overland sheet flow was utilized for the Predevelopment condition along with 100 feet of overland sheet flow for the post-development condition before translating into shallow concentrated flow. Any signs of a definable channel were accounted for and, therefore, based on each travel path, a collective Time of Concentration was determined therein indicating the time at which the entire drainage area is contributing to the study point. (See Appendix C)

Resultant hydrographs were simulated and created for the site drainage area during Predevelopment Conditions. Peak discharge and runoff volumes were calculated and recorded from the generated hydrographs for each storm event. Table 1 summarizes the drainage characteristics for each drainage area associated with the design storm frequencies. Table 1 below summarizes the pre-development conditions for the 193.4 acre watershed.

	Hydrograph Volume (ac.-ft.)	Peak Flow (cfs)
Over bank Protection (10-Year Storm)	53.546	434.54
Extreme Flood Protection (100-Year Storm)	90.696	725.68

TABLE 1: PRE-DEVELOPMENT CONDITIONS

Post-Development Conditions

The proposed development consists of the conversion of approximately 19.48 acres of wooded and brush areas into a 90-unit townhouse complex with associated roads, driveways, rooftops and lawn areas. Under standard NYSDEC criteria for attenuating the increase in discharge associated with this conversion, stormwater quality areas have been designed throughout the site. These designs include pockets ponds, bio-retention areas and dry swales. These facilities shall treat the required water quality volumes for the site as required by the NYSDEC. However, because of the site's location, size and volume of discharge in comparison to the contributing watershed and size of the discharging body, it was determined that the site would be better suited to be left undetained for higher frequency storms provided that all hydraulic devices conveying site runoff were not negatively affected.

As better alternative, water quality facilities as mentioned above was designed to collect impervious coverage from the site development. These facilities are located throughout the site plan and discharge into the Federal Jurisdictional Wetlands located on each side of the development (See Appendix A). These facilities shall treat and attenuate the 1-year storm for water quality. These areas will also promote the ability for infiltration and conversion of stormwater back to predevelopment patterns. After treatment the runoff shall discharge into the adjacent wetland areas. These wetland areas directly discharge into the Masonic Creek and Silver Lake at the design outfall (Outfall 1) used in the analysis. Higher frequency storms shall be discharged to the existing watercourses throughout the site. Flow splitters for each inlet point to the water quality facilities have been designed. These splitters shall serve to convey the water quality storm to the treatment areas and allow the higher storms to bypass the water quality facilities. Under the requirements for a waiver for water quantity, treatment of the higher storm frequencies is not required.

After analyzing each scenario in conjunction with the overall surrounding drainage area, it was found that the proposed peak flow rates decrease in an undetained condition. This decrease can be attributed to the extended release rate of runoff created by the proposed detention basins throughout the site. The peak flow rate is held by the basins for the site and released at the same approximate time as the overall drainage area surrounding it. This creates a larger peak flow rate for the drainage area at one particular time rather than staggering the peak flow rates and velocities over a period time. This staggering of peak rates presents a more favorable condition for downstream stability and wetland survival. A summary of this analysis can be found in Table 2 below.

As was done for the pre-development conditions, the Cumulative Curve Numbers and Times of Concentration for each of these areas were determined based upon the existing and proposed ground covers and the grading of the site. (See Appendix C) This analysis included the proposed development of the 19.34 acre parcel.

	Detained Hydrograph Volume(ac.-ft.)	Undetained Peak Flow (cfs)	Peak Flow (cfs)
Over bank Protection (10-Year Storm)	53.750	466.37	459.73
Extreme Flood Protection (100-Year Storm)	90.700	774.72	765.03

TABLE 2: POST-DEVELOPMENT CONDITIONS

Table 3 below summarizes the net change in the peak rates of runoff due to the downstream analysis for the site. As can be seen, undetained post-development peak flow rates are less than detained post-development peak rates of discharge for the proposed drainage area limits. The detained post development rates were based upon the site having detention basins in conjunction with water quality areas.

	Pre-Development (cfs)	Detained Post-Development (cfs)	Undetained Post-Development (cfs)
Over bank Protection (10-Year Storm)	434.54	446.37	459.73
Extreme Flood Protection (100-Year Storm)	725.68	774.72	765.03

TABLE 3: COMPARISON OF PRE- AND POST-DEVELOPMENT PEAK DISCHARGES

The existing structures downstream of this analysis area were examined for capacity to convey the incoming area to each structure. The only structures located within the downstream watershed limits are located at the intersection of Silver Lake Scotchtown Road and Mud Mills and downstream along Bert Crawford Road at the lake inlet. These structures include a large box culvert approximately 17.5'W x 5.5' H which conveys drainage from the Masonic Creek to the Silver Lake inlet point.

The arch culverts located under Bert Crawford Road provide an additional 2-3 ft of storage before the water surface elevation would endanger the roadway. The site is situated in a location that the peak flow generated from the site will have passed through the existing culverts and arch pipe inlets into the Silver Lake before the peak discharge for the entire watershed has reached the same point. Utilizing the 10% rule from downstream analysis from the NYSDEC, this portion of the watershed site was analyzed to be best served by not detaining the peak rates to combine at the same time. The box culvert along Silver Lake Scotchtown Road has been sized to account for the peak of the entire 7,600-acre watershed, which is much greater than the post development runoff generated from the proposed project. From a comparison of the increasing volumes to Silver Lake the water surface elevation will not be impacted. The watershed is increased only by a 0.1 ac-ft, which would increase the 32-acre Silver Lake water surface elevation by 0.003' an immeasurable amount.

	Pre-hydrograph Volume (ac.-ft.)	Undetained Post-hydrograph Volume (ac.-ft.)	Detained Post-hydrograph Volume (ac.-ft.)
Over bank Protection (10-Year Storm)	53.74	53.75	54.23
Extreme Flood Protection (100-Year Storm)	90.69	90.70	91.27

TABLE 4: COMPARISON OF PRE- AND POST-DEVELOPMENT PEAK VOLUMES

V. Water Quality

The water quality volume denoted as WQv is designed to improve water quality sizing to capture and treat 90% of the average annual stormwater runoff volume. The WQv is directly related to the amount impervious cover created at a site. New York State Department of Environmental Conservation has developed the following equation to determine the water quality storage volume. Please Refer to Appendix A for Drainage Maps for specific area locations. Refer to Appendix D for water quality design and sizing of facilities.

Below are calculations developed specifically for Covered Bridge Project.

$$\frac{WQv = (P)(Rv)(A)}{12}$$

Where WQv = Water quality volume

P = 90% rainfall event number (Figure 4.1 NYSDEC Manual)

Rv = 0.05 + 0.009(I), where I is percent impervious cover

A = site area in acres

Area A-1

$P = 1.25$

$I = 8.9\%$

$R_v = 0.05 + 0.009(10.1) = 0.14$ —use 0.2 required minimum

$A = 6.83$

$$WQ_v = \frac{(1.25)(0.2)(6.83)}{12}$$

$$WQ_v = \frac{1.70}{12}$$

$WQ_v = 0.14$ acre/feet (required)

Total WQ_v = provided 0.14 ac.-ft

Total WQ_v = provided 6,200 cu-ft

Combination of dry swale and bioretention area shall provide the necessary water quality volume. Please refer to Appendix D for design calculations for each facility.

Area A-2

$P = 1.25$

$I = 50.8\%$

$R_v = 0.05 + 0.009(50.8) = 0.51$

$A = 2.52$

$$WQ_v = \frac{(1.25)(0.51)(2.52)}{12}$$

$$WQ_v = \frac{1.60}{12}$$

$WQ_v = 0.13$ acre/feet (required)

Total WQ_v = provided 0.14 ac.-ft

Total WQ_v = provided 6,200 cu-ft

A proposed pocket pond (N.Y.S. DEC P-5 Design) is to be utilized with sediment forebay and permanent water elevation. Please refer to Appendix D for design calculations for each facility.

Area A-3

P = 1.25
I = 55.1%
Rv = 0.05 + 0.009(55.1) = 0.54
A = 2.25

$$WQv = \frac{(1.25)(0.54)(2.25)}{12}$$

$$WQv = \frac{1.51}{12}$$

WQv = 0.126 acre/feet (required)

Total WQv = provided 0.13 ac.-ft
Total WQv = provided 5,662 cu-ft

Bioretention area shall provide the necessary water quality volume. Please refer to Appendix D for design calculations for each facility.

Area A-4

P = 1.25
I = 72.3%
Rv = 0.05 + 0.009(72.3) = 0.70
A = 1.91

$$WQv = \frac{(1.25)(0.70)(1.91)}{12}$$

$$WQv = \frac{1.67}{12}$$

WQv = 0.14 acre/feet (required)

Total WQv = provided 0.14 ac.-ft
Total WQv = provided 6,200 cu-ft

Bioretention area shall provide the necessary water quality volume. Please refer to Appendix D for design calculations for each facility.

Area B-1

$$P = 1.25$$

$$I = 5.6\%$$

$$R_v = 0.05 + 0.009(5.6) = 0.10 \text{—Use Minimum of 0.2}$$

$$A = 3.57$$

$$WQ_v = \frac{(1.25)(0.2)(3.57)}{12}$$

$$WQ_v = \frac{0.89}{12}$$

$$WQ_v = 0.07 \text{ acre/feet (required)}$$

$$\text{Total } WQ_v = \text{provided } 0.10 \text{ ac.-ft}$$

$$\text{Total } WQ_v = \text{provided } 4,356 \text{ cu-ft}$$

Dry Swale shall provide the necessary water quality volume. Please refer to Appendix D for design calculations for each facility.

Area B-2

$$P = 1.25$$

$$I = 27.1\%$$

$$R_v = 0.05 + 0.009(27.1) = 0.29$$

$$A = 1.81$$

$$WQ_v = \frac{(1.25)(0.29)(1.81)}{12}$$

$$WQ_v = \frac{0.65}{12}$$

$$WQ_v = 0.06 \text{ acre/feet (required)}$$

$$\text{Total } WQ_v = \text{provided } 0.06 \text{ ac.-ft}$$

$$\text{Total } WQ_v = \text{provided } 2,613 \text{ cu-ft}$$

Bioretention area shall provide the necessary water quality volume. Please refer to Appendix D for design calculations for each facility.

Currently, the New York State Department of Environmental Conservation recognizes five categories for meeting stormwater quality objections. These categories are listed in Table 5.1 of the New York State Department of Environmental Conservation Manuals and are included as Appendix E of this report. Upon review of the proposed site layout, coupled with site topography and design criteria, bio-retention filtration was chosen to treat the stormwater quality volume and to provide a small attenuation of peak flows before filtration occurs. Overflow structures are provided within the bioretention areas in the form of catch basins to convey surface flow greater than the 1-year storm event. An emergency spillway has been proposed for the pocket pond for storm flows exceeding the 100-year storm. Dry swales throughout the site were utilized to provide water quality treatment before being discharged into the exiting watercourses and wetlands. Also, a 3" mulch layer has been provided to ensure the erosion is minimized within the bio-retention area and filtration characteristics are retained. Please refer to Appendix D for design and sizing criteria as set by the NYSDEC stormwater management manual.

VI. Erosion and Sediment Control Plan

In addition to the above, the new general SPDES Permit for construction activities also requires an Erosion and Sediment Control plan be developed. This plan was developed as part of the subdivision plans (Appendix I), which should be available at the Town Hall and the construction site. They are also in compliance with current and proposed regulations, including construction sequence, both short- and long-term maintenance of facilities, storage of materials and temporary and permanent structures.

As the site is proposed for construction of single-family residences only, no unusual chemical or waste product (other than construction related) is anticipated at the site. Therefore, erosion control methods employed are based upon the guidelines for Urban Erosion and Sediment Controls for new developments were utilized. Disturbance of over five acres of land is not permitted during construction. To mitigate this potential impact on construction, once an area has been disturbed (grubbing and topsoil removal) temporary seeding and stabilization measures should be implemented as outlined within the erosion and sediment control plans. Once temporary seeding and stabilization measures are utilized disturbance may continue to another portion of the project. Attached as Appendix F are standard erosion and sediment control practices to be utilized during the construction phase of the project.

VII. Conclusions

After analyzing the overall drainage area surrounding the project site utilizing the 10% rule, it was found that the proposed peak flow rates in an undetained condition will better serve the drainage patterns within the watershed as compared to a detained site condition. This can be attributed to the extended release rate of runoff created by proposed basins in the detained condition. By allowing an undetained flow condition, the staggering of peak rates presents a more favorable condition for downstream stability and wetland survival as opposed to holding the peak rate which could exacerbate flooding conditions, as exhibited in the detained condition. The hydraulic analysis provided meets all of the requirements necessary for the exemption of water quantity control. All necessary water quality requirements shall be met by the construction of the proposed facilities on site.

By implementing both the subdivision plans and erosion and control plans during the construction of the proposed project, current New York State Department of Environmental Conservation and Town regulations can be met. However, the owner and contractor are responsible for implementation of project's erosion and sediment controls and any required maintenance. In addition, this also includes filing the NOI, completing the certification statement (refer to Appendix H) and meeting all requirements of the General Permit, including site assessment and inspections. For assistance to the owner and contractor, a copy of the General Permit is included as Appendix G of this report.

Respectfully submitted,

LANC & TULLY, P.C.



John Queenan
Project Engineer

JQ/gjl
Attachments

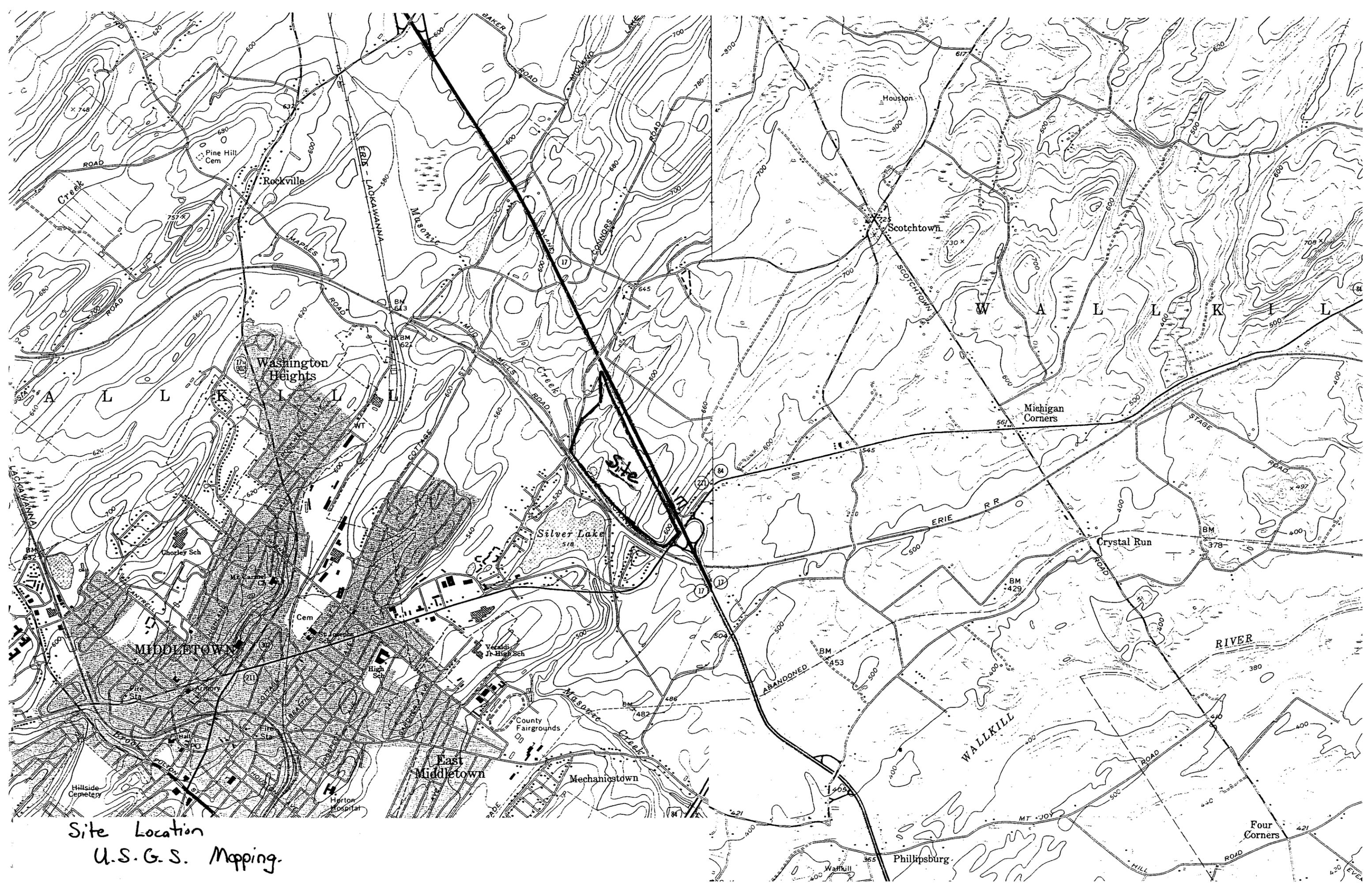
goldentri.swppp.engrpt.doc

LIST OF APPENDICES

- APPENDIX A: SITE LOCATION MAP**
- APPENDIX B: PRE- AND POST DEVELOPMENT MAPS**
- APPENDIX C: PRE- AND POST DEVELOPMENT MODEL AND ANALYSIS**
- APPENDIX D: WATER QUALITY COMPUTATIONS**
- APPENDIX E: EXCERPTS FROM NEW YORK STATE STORMWATER DESIGN MANUAL**
- APPENDIX F: STANDARD EROSION & SEDIMENT CONTROL PRACTICES**
- APPENDIX G: BLANK NOTICE OF INTENT (NOI)**
- APPENDIX H: NYSDEC CERTIFICATION STATEMENT**
- APPENDIX I: SITE PLANS**

APPENDIX A

SITE LOCATION MAPS

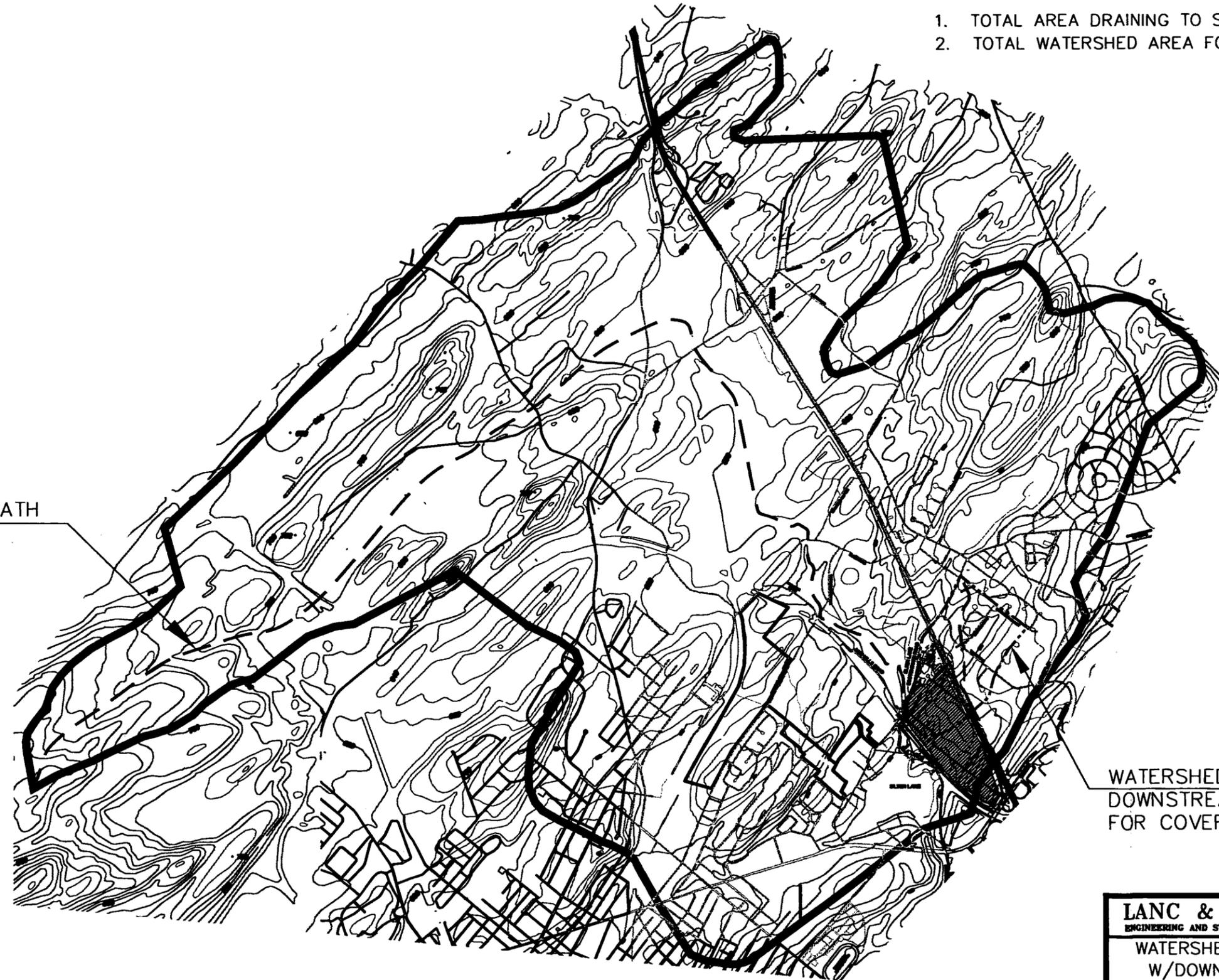


Site Location
U.S.G.S. Mapping.

APPENDIX B

PRE- & POST DEVELOPMENT MAPS

1. TOTAL AREA DRAINING TO SILVER LAKE 7600 AC±
2. TOTAL WATERSHED AREA FOR DOWNSTREAM ANALYSIS= 193.4±AC.

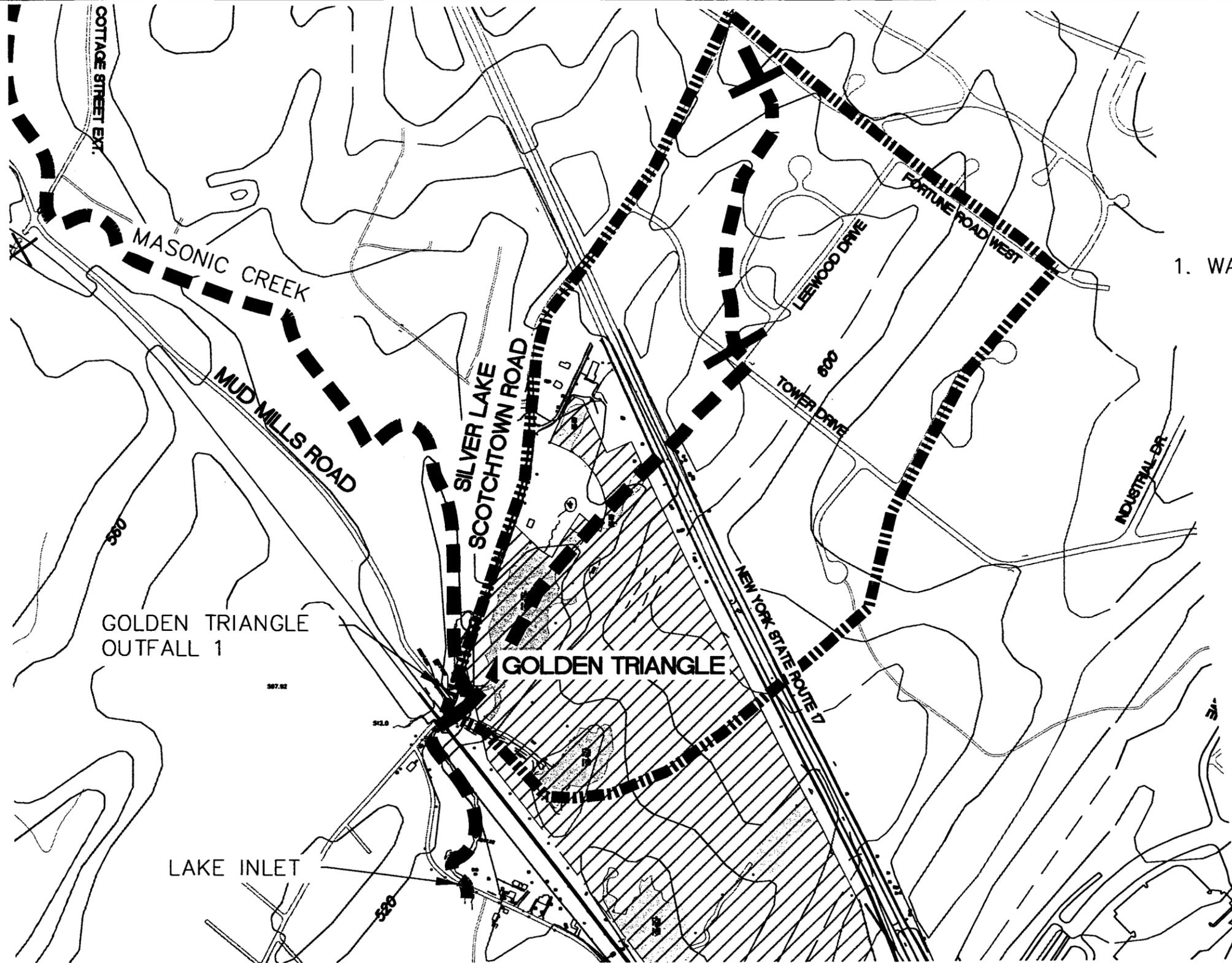


TIME OF CONCENTRATION PATH
(ENTIRE WATERSHED)

WATERSHED AREA
DOWNSTREAM ANALYSIS
FOR COVERED BRIDGE

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LANC & TULLY ENGINEERING AND SURVEYING, P.C.		P.O. Box 887, Rt. 287 Goshen, N.Y. 10924 (845) 294-8780		DATE MARCH 7, 2005	
WATERSHED AREA FOR SILVER LAKE W/DOWNSTREAM ANALYSIS AREA				DRAWING NO. D-03-0027-01	
COVERED BRIDGE AT GOLDENT TRIANGLE				SHEET NO. 1 OF 1	
TOWN OF WALLKILL ORANGE COUNTY, NEW YORK				DRAWING NO. D-03-0027-01	
Drawn By: JO	Checked By:	Scale: 1" = 400'	Proj. No.:	N/A	



1. WATERSHED AREA FOR DOWNSTREAM ANALYSIS
 AREA = 193.48 ACRES

LEGEND:

- MAJOR CONTOUR INTERVAL 
- MINOR CONTOUR INTERVAL 
- WATERSHED BOUNDARY 
- TIME OF CONCENTRATION W/SEGMENT DELINEATION 
- FEDERAL WETLAND AREAS 

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P.O. Box 897, Rt. 997
 Goshen, N.Y. 10924
 (845) 254-3700

DATE: MARCH 7, 2005
 DRAINAGE DISTRICT: DOWN
 SHEET NO.: 1 OF 1

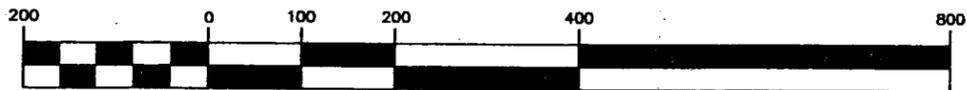
**COVERED BRIDGE
 AT
 GOLDENT TRIANGLE**
 TOWN OF WALLKILL
 ORANGE COUNTY, NEW YORK

Drawn By: JO	Checked By:	Scale: 1" = 600'	Site Map No.: N/A	Drawing No.: D-03-0027-01
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LEGEND:

- MAJOR CONTOUR INTERVAL 
- MINOR CONTOUR INTERVAL 
- WATERSHED BOUNDARY 
- TIME OF CONCENTRATION 
- FEDERAL WETLAND AREAS 

GRAPHIC SCALE



(IN FEET)
1 inch = 200 ft

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Catskill, N.Y. 12524
(845) 294-3700

PRE-DEVELOPMENT CONDITIONS
PREPARED FOR

**COVERED BRIDGE
AT
GOLDEN TRIANGLE**
TOWN OF WALLKILL
ORANGE COUNTY, NEW YORK

Date: DECEMBER 14, 2004

Revisions:

CSL File: DRAINAGECONDOS.DWG

Legend: PREDEV

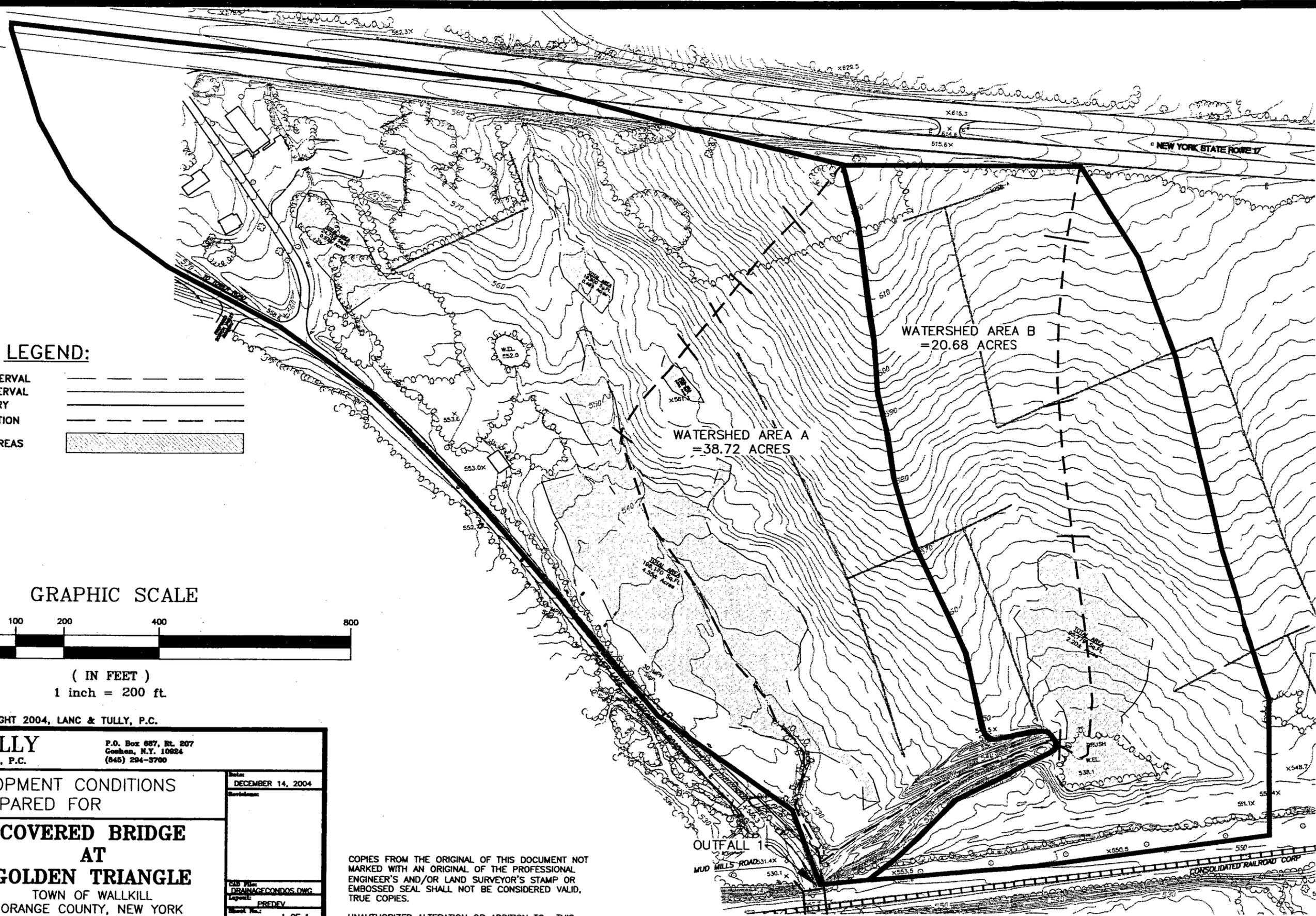
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Checked By:
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- WATERSHED BOUNDARY 
- TIME OF CONCENTRATION 
- FEDERAL WETLAND AREAS 

GRAPHIC SCALE



(IN FEET)
1 inch = 200 ft.

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POST-DEVELOPMENT CONDITIONS
PREPARED FOR

**COVERED BRIDGE
AT
GOLDEN TRIANGLE**
TOWN OF WALLKILL
ORANGE COUNTY, NEW YORK

Date: DECEMBER 14, 2004

CAD File: DRAINAGECONDOS.DWG

Layout: PREDEV

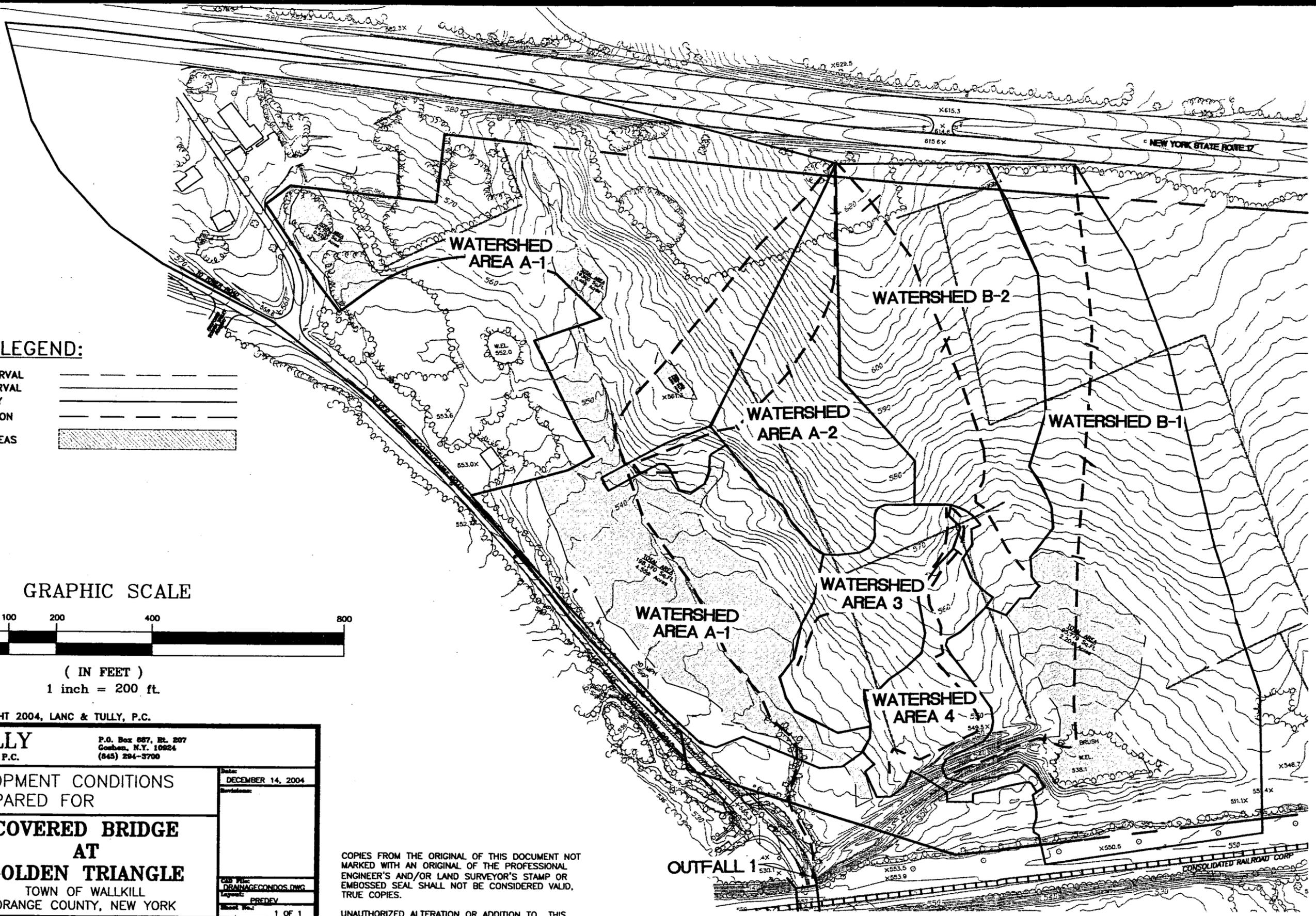
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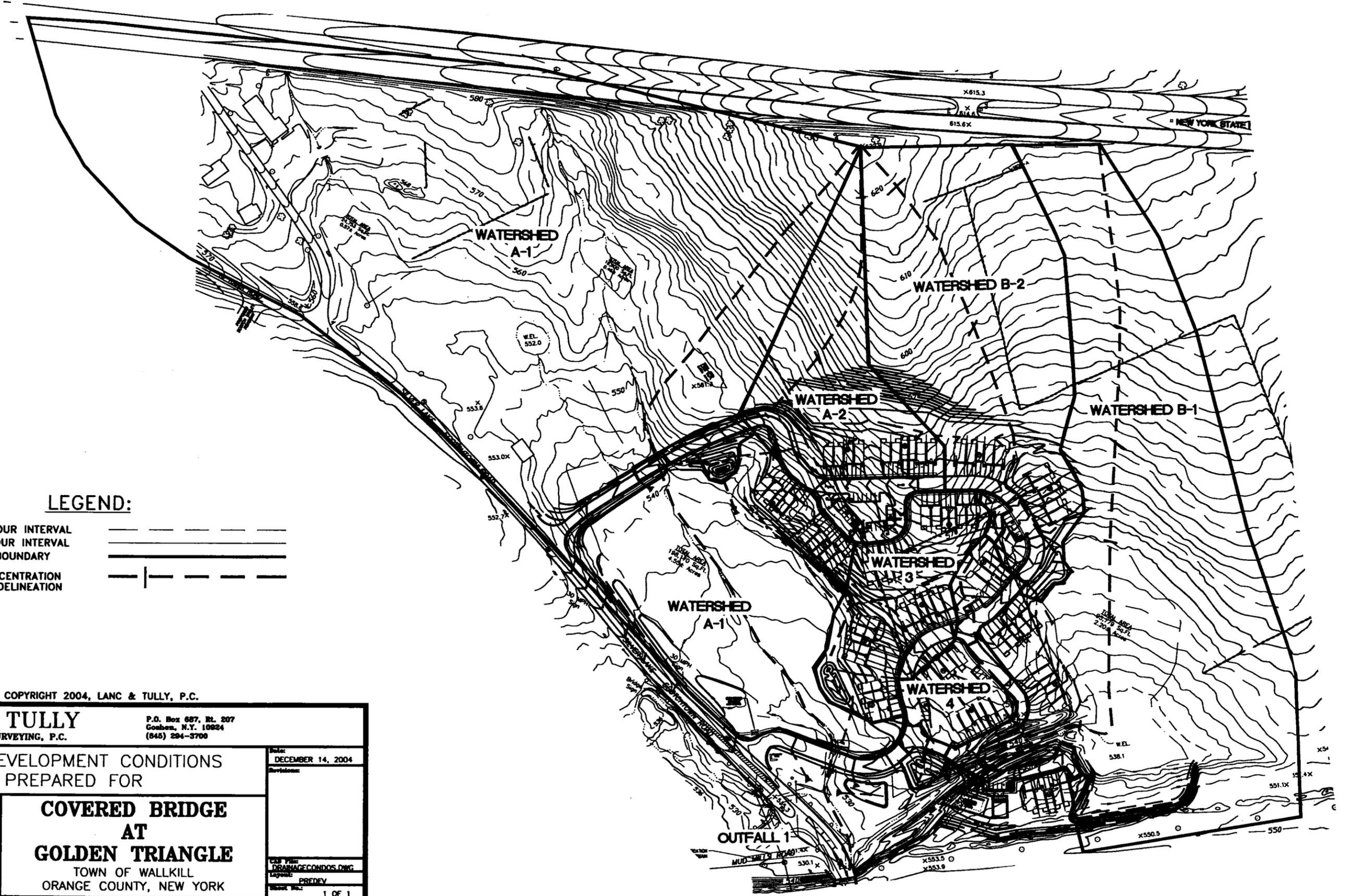
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- MINOR CONTOUR INTERVAL
- WATERSHED BOUNDARY
- TIME OF CONCENTRATION W/SEGMENT DELINEATION

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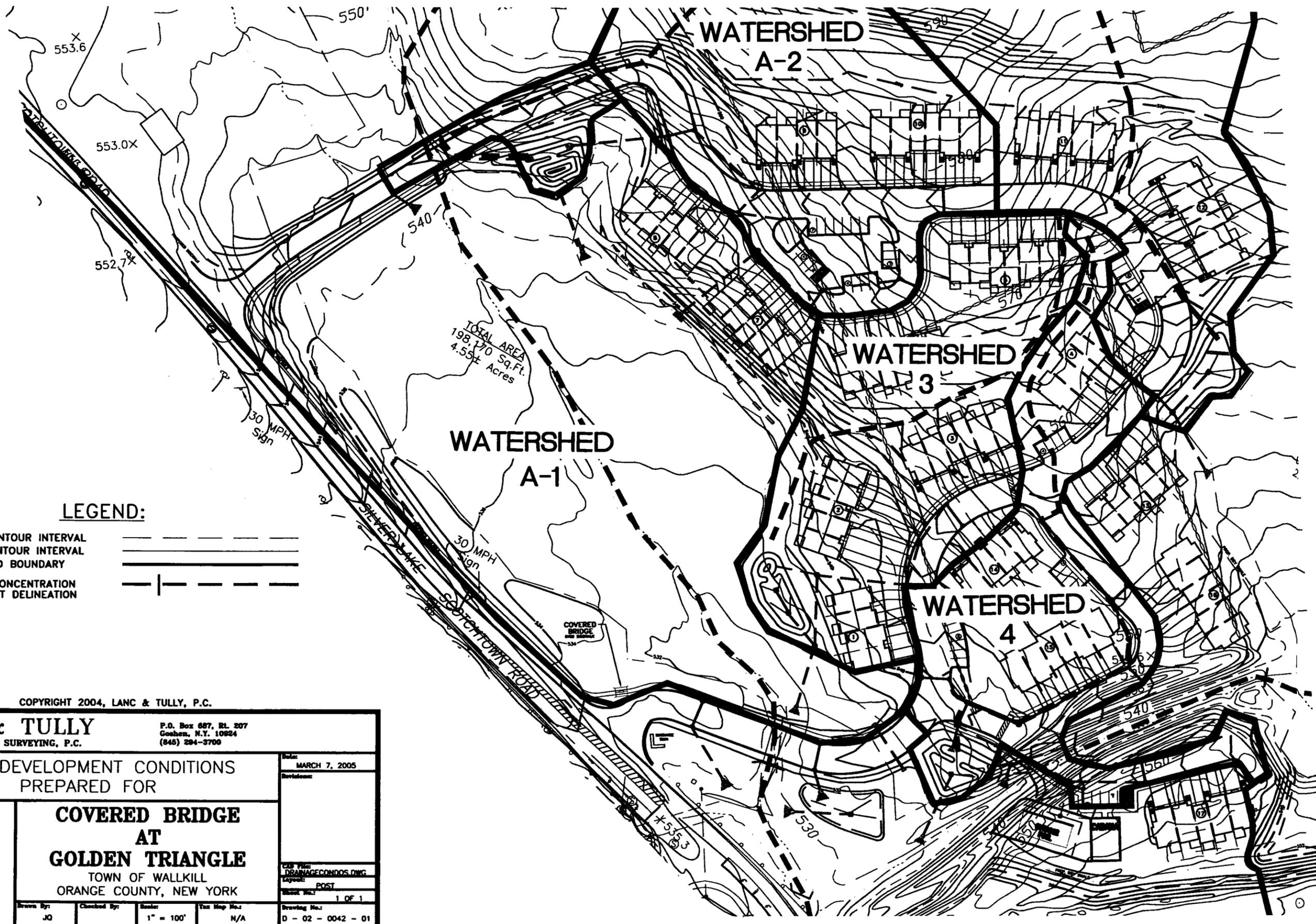
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Goshen, N.Y. 10924
(845) 294-3700

POST-DEVELOPMENT CONDITIONS
PREPARED FOR

**COVERED BRIDGE
AT
GOLDEN TRIANGLE**
TOWN OF WALLKILL
ORANGE COUNTY, NEW YORK

Date: DECEMBER 14, 2004
Revisions:
CADD FILE: DRAINAGECONDOS.DWG
Layout: PREDEV
Sheet No.: 1 OF 1
Drawing No.: D - 02 - 0042 - 01

Drawn By: JO	Checked By:	Scale: 1" = 200'	Tax Map No.: N/A
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LEGEND:

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- MINOR CONTOUR INTERVAL
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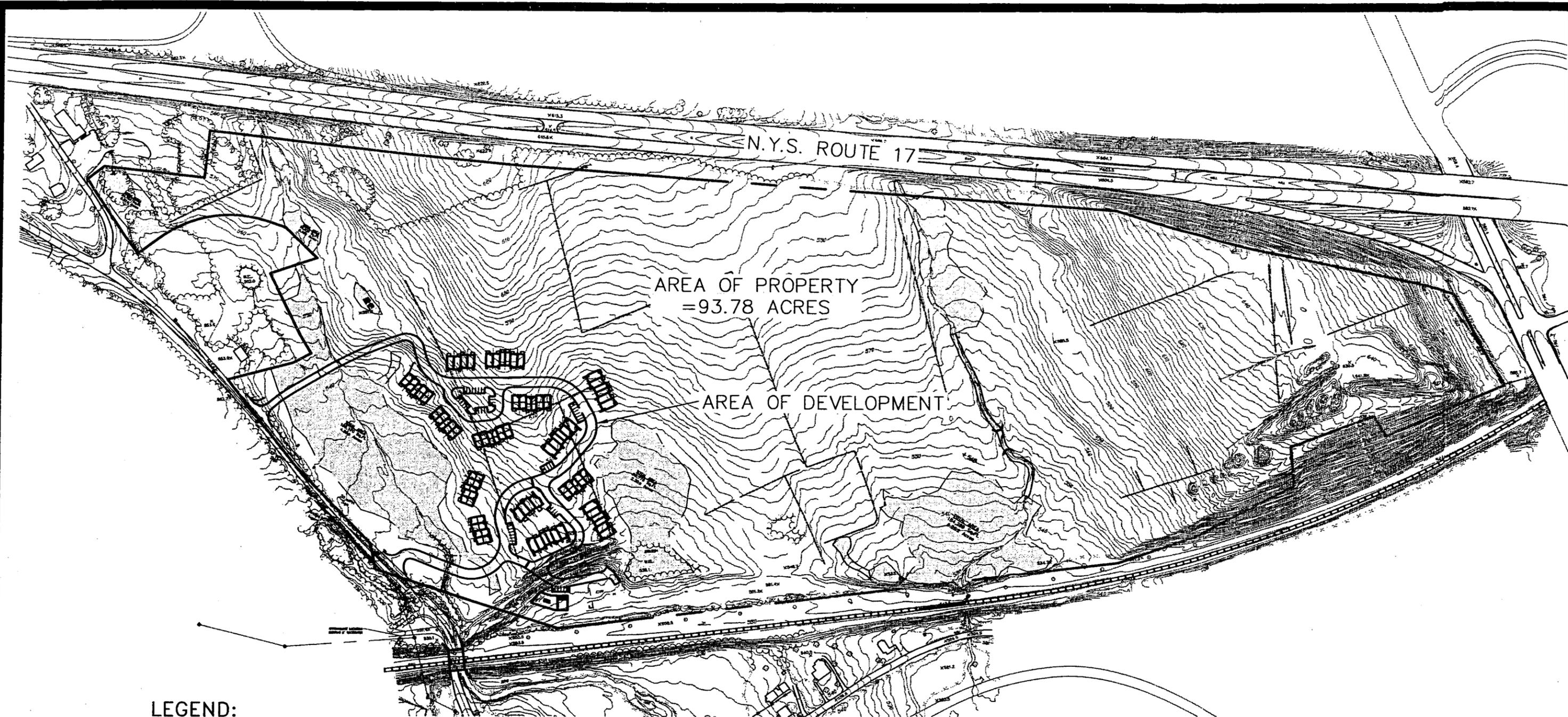
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Goshen, N.Y. 10824
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POST-DEVELOPMENT CONDITIONS
PREPARED FOR

**COVERED BRIDGE
AT
GOLDEN TRIANGLE**
TOWN OF WALKILL
ORANGE COUNTY, NEW YORK

Date: MARCH 7, 2005
 Revisions:
 User: LANC & TULLY
 File: DRAINAGECONDOS.DWG
 Layout: POST
 Sheet No.: 1 OF 1
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AREA OF PROPERTY
= 93.78 ACRES

AREA OF DEVELOPMENT

N.Y.S. ROUTE 17

LEGEND:

- MAJOR CONTOUR INTERVAL
- MINOR CONTOUR INTERVAL
- WATERSHED BOUNDARY
- PROPOSED BUILDINGS
- PROPOSED EDGE OF PAVEMENT
- PROPOSED EDGE OF CURB
- FEDERAL WETLAND AREAS

GRAPHIC SCALE



(IN FEET)
1 inch = 300 ft.

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PROPOSED DEVELOPMENT PLAN
PREPARED FOR

**COVERED BRIDGE AT
GOLDEN TRIANGLE**

TOWN OF WALLKILL
ORANGE COUNTY, NEW YORK

Date: DECEMBER 20, 2004
Revisions:

CAD File: DRAINAGECONDOS.DWG
Layout: DFV
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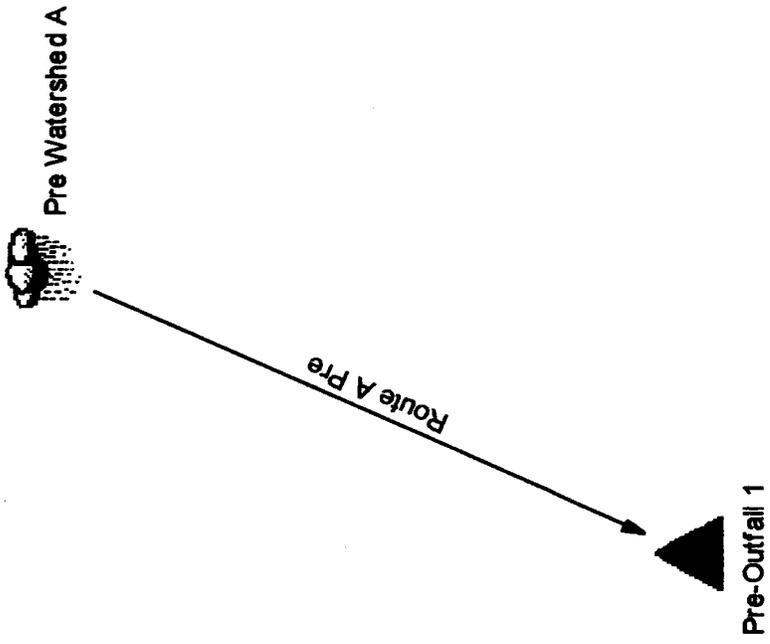
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APPENDIX C

PRE- & POST DEVELOPMENT MODEL AND ANALYSIS



=====
JOB TITLE
=====

Project Date: 12/14/2004
Project Engineer: Lorraine Potter
Project Title: Covered Bridge at Golden Triangle
Project Comments:
Pre Development Conditions
Downstream Analysis
90 UnitTownhouse Development
Town of Wallkill, Orange County

Table of Contents

***** MASTER SUMMARY *****

Master Network Summary
 Watershed 1.01

***** NETWORK SUMMARIES (DETAILED) *****

Executive Summary (Links)
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 Watershed 10 2.02
 Watershed 100 2.03

Executive Summary (Nodes)
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 Watershed 10 2.05
 Watershed 100 2.06

Network Calcs Sequence
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***** DESIGN STORMS SUMMARY *****

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 Orange County 1 3.02

***** TC CALCULATIONS *****

Tc Calcs
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***** CN CALCULATIONS *****

Runoff CN-Area
 PRE WATERSHED A 5.01

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***** RUNOFF HYDROGRAPHS *****

Unit Hyd. Equations	6.01
.....	
Unit Hyd. Summary	
PRE WATERSHED A 1	6.03
PRE WATERSHED A 10	6.04
PRE WATERSHED A 100	6.05

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Orange County

Return Event	Total Depth in	Rainfall Type	RNF ID
1	2.9000	Synthetic Curve	TypeIII 24hr
10	5.5000	Synthetic Curve	TypeIII 24hr
100	8.0000	Synthetic Curve	TypeIII 24hr

MASTER NETWORK SUMMARY
 SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
 (Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
PRE WATERSHED A	AREA	1	18.954		12.3500	151.01		
PRE WATERSHED A	AREA	10	53.746		12.3500	434.54		
PRE WATERSHED A	AREA	100	90.696		12.3000	725.68		
*PRE-OUTFALL 1	JCT	1	18.954		12.3500	151.01		
*PRE-OUTFALL 1	JCT	10	53.746		12.3500	434.54		
*PRE-OUTFALL 1	JCT	100	90.696		12.3000	725.68		

Type.... Executive Summary (Links) Page 2.01
 Name.... Watershed Event: 1 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

NETWORK SUMMARY -- LINKS
 (UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 1

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 1 yr
 Total Rainfall Depth= 2.9000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Peak Time Trun. hrs	Peak Q cfs	End Points
ROUTE A PRE	ADD	UN	18.954	12.3500	151.01	PRE WATERSHED A
		DL	18.954	12.3500	151.01	
		DN	18.954	12.3500	151.01	PRE-OUTFALL 1

Type.... Executive Summary (Links) Page 2.02
 Name.... Watershed Event: 10 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 10

NETWORK SUMMARY -- LINKS
 (UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 10

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 10 yr
 Total Rainfall Depth= 5.5000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Peak Time Trun. hrs	Peak Q cfs	End Points
ROUTE A PRE	ADD	UN	53.746	12.3500	434.54	PRE WATERSHED A
		DL	53.746	12.3500	434.54	
		DN	53.746	12.3500	434.54	PRE-OUTFALL 1

Type.... Executive Summary (Links) Page 2.03
 Name.... Watershed Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

NETWORK SUMMARY -- LINKS
 (UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 100

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 100 yr
 Total Rainfall Depth= 8.0000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type	HYG Vol ac-ft	Peak Time Trun. hrs	Peak Q cfs	End Points
ROUTE A PRE	ADD	UN 90.696	12.3000	725.68	PRE WATERSHED A
		DL 90.696	12.3000	725.68	
		DN 90.696	12.3000	725.68	PRE-OUTFALL 1

Type.... Executive Summary (Nodes) Page 2.04
 Name.... Watershed Event: 1 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

NETWORK SUMMARY -- NODES
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 1

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 1 yr
 Total Rainfall Depth= 2.9000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Qpeak Trun. hrs	Qpeak cfs	Max WSEL ft
PRE WATERSHED A	AREA	18.954	12.3500	151.01	
Outfall PRE-OUTFALL 1	JCT	18.954	12.3500	151.01	

Type.... Executive Summary (Nodes) Page 2.05
 Name.... Watershed Event: 10 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 10

NETWORK SUMMARY -- NODES

(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 10

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 10 yr
 Total Rainfall Depth= 5.5000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Qpeak Trun. hrs	Qpeak cfs	Max WSEL ft
PRE WATERSHED A	AREA	53.746	12.3500	434.54	
Outfall PRE-OUTFALL 1	JCT	53.746	12.3500	434.54	

NETWORK SUMMARY -- NODES

(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 100

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 100 yr
 Total Rainfall Depth= 8.0000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Qpeak Trun. hrs	Qpeak cfs	Max WSEL ft
PRE WATERSHED A	AREA	90.696	12.3000	725.68	
Outfall PRE-OUTFALL 1	JCT	90.696	12.3000	725.68	

Type.... Network Calcs Sequence

Page 2.07

Name.... Watershed

Event: 100 yr

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

Storm... TypeIII 24hr Tag: 100

NETWORK RUNOFF NODE SEQUENCE

```

=====
Runoff Data          Apply to Node          Receiving Link
=====
SCS UH  PRE WATERSHED A  Subarea  PRE WATERSHED A  Add Hyd  PRE WATERSHED A

```

Type.... Network Calcs Sequence

Page 2.08

Name.... Watershed

Event: 100 yr

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

Storm... TypeIII 24hr Tag: 100

NETWORK ROUTING SEQUENCE

```
=====
Link Operation          UPstream Node          DNstream Node
=====
Add Hyd ROUTE A PRE    Subarea PRE WATERSHED A  Jct    PRE-OUTFALL 1
=====
```

Type.... Design Storms
Name.... Orange County

File.... T:\Land Projects R2\020042TRI\PondPack files\
Title... Project Date: 12/14/2004
Project Engineer: Lorraine Potter
Project Title: Covered Bridge at Golden Triangle
Project Comments:
Pre Development Conditions
Downstream Analysis
90 UnitTownhouse Development
Town of Wallkill, Orange County

DESIGN STORMS SUMMARY

Design Storm File, ID = Orange County

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 8.0000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Type.... Design Storms
Name.... Orange County
File.... T:\Land Projects R2\020042TRI\PondPack files\
Storm... TypeIII 24hr Tag: 1

Page 3.02
Event: 1 yr

DESIGN STORMS SUMMARY

Design Storm File, ID = Orange County

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 8.0000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

.....
TIME OF CONCENTRATION CALCULATOR
.....

Segment #1: Tc: TR-55 Sheet

Mannings n .2400
Hydraulic Length 150.00 ft
2yr, 24hr P 3.5000 in
Slope .050000 ft/ft

Avg.Velocity .19 ft/sec

Segment #1 Time: .2180 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length 1520.00 ft
Slope .040000 ft/ft
Unpaved

Avg.Velocity 3.23 ft/sec

Segment #2 Time: .1308 hrs

Segment #3: Tc: TR-55 Channel

Flow Area 8.0000 sq.ft
Wetted Perimeter 10.00 ft
Hydraulic Radius .80 ft
Slope .020000 ft/ft
Mannings n .0270
Hydraulic Length 2700.00 ft

Avg.Velocity 6.73 ft/sec

Segment #3 Time: .1115 hrs

=====
Total Tc: .4604 hrs
=====

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

Tc Equations used...

==== SCS TR-55 Sheet Flow =====

$$Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))$$

Where: Tc = Time of concentration, hrs
n = Mannings n
Lf = Flow length, ft
P = 2yr, 24hr Rain depth, inches
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow =====

Unpaved surface:

$$V = 16.1345 * (Sf**0.5)$$

Paved surface:

$$V = 20.3282 * (Sf**0.5)$$

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: V = Velocity, ft/sec
Sf = Slope, ft/ft
Tc = Time of concentration, hrs
Lf = Flow length, ft

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

==== SCS Channel Flow =====

$$R = Aq / Wp$$
$$V = (1.49 * (R^{2/3}) * (Sf^{-0.5})) / n$$

$$Tc = (Lf / V) / (3600\text{sec/hr})$$

- Where: R = Hydraulic radius
Aq = Flow area, sq.ft.
Wp = Wetted perimeter, ft
V = Velocity, ft/sec
Sf = Slope, ft/ft
n = Mannings n
Tc = Time of concentration, hrs
Lf = Flow length, ft

Type.... Runoff CN-Area
Name.... PRE WATERSHED A

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

RUNOFF CURVE NUMBER DATA

.....

Soil/Surface Description	CN	Area acres	Impervious Adjustment		Adjusted CN
			%C	%UC	
Commercial & Business Areas	94	20.000			94.00
Residential Districts - 1/4 acre	83	84.000			83.00
Wooded Fair C Soils	73	87.480			73.00
Wooded Fair D Soils	79	2.000			79.00
COMPOSITE AREA & WEIGHTED CN --->		193.480			79.57 (80)

.....

Name....

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

SCS UNIT HYDROGRAPH METHOD
(Computational Notes)

DEFINITION OF TERMS: -----

At = Total area (acres): $At = Ai + Ap$
 Ai = Impervious area (acres)
 Ap = Pervious area (acres)
 CNi = Runoff curve number for impervious area
 CNp = Runoff curve number for pervious area
 fLoss = f loss constant infiltration (depth/time)
 gKs = Saturated Hydraulic Conductivity (depth/time)
 Md = Volumetric Moisture Deficit
 Psi = Capillary Suction (length)
 hK = Horton Infiltration Decay Rate (time⁻¹)
 fo = Initial Infiltration Rate (depth/time)
 fc = Ultimate(capacity) Infiltration Rate (depth/time)
 Ia = Initial Abstraction (length)
 dt = Computational increment (duration of unit excess rainfall)
 Default dt is smallest value of $0.1333Tc$, r_{tm} , and t_h
 (Smallest dt is then adjusted to match up with T_p)
 UDDt = User specified override computational main time increment
 (only used if UDDt is $\Rightarrow .1333Tc$)
 D(t) = Point on distribution curve (fraction of P) for time step t

 K = $2 / (1 + (T_r/T_p))$: default K = 0.75: (for $T_r/T_p = 1.67$)
 Ks = Hydrograph shape factor
 = Unit Conversions * K:
 = $((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K$
 Default Ks = $645.333 * 0.75 = 484$

 Lag = Lag time from center of excess runoff (dt) to T_p : Lag = $0.6T_c$
 P = Total precipitation depth, inches
 Pa(t) = Accumulated rainfall at time step t
 Pi(t) = Incremental rainfall at time step t
 qp = Peak discharge (cfs) for lin. runoff, for 1hr, for 1 sq.mi.
 = $(K_s * A * Q) / T_p$ (where Q = lin. runoff, A=sq.mi.)
 Qu(t) = Unit hydrograph ordinate (cfs) at time step t
 Q(t) = Final hydrograph ordinate (cfs) at time step t
 Rai(t) = Accumulated runoff (inches) at time step t for impervious area
 Rap(t) = Accumulated runoff (inches) at time step t for pervious area
 Rii(t) = Incremental runoff (inches) at time step t for impervious area
 Rip(t) = Incremental runoff (inches) at time step t for pervious area
 R(t) = Incremental weighted total runoff (inches)
 Rtm = Time increment for rainfall table
 Si = S for impervious area: $Si = (1000/CNi) - 10$
 Sp = S for pervious area: $Sp = (1000/CNp) - 10$
 t = Time step (row) number
 Tc = Time of concentration
 Tb = Time (hrs) of entire unit hydrograph: $Tb = T_p + T_r$
 Tp = Time (hrs) to peak of a unit hydrograph: $Tp = (dt/2) + Lag$
 Tr = Time (hrs) of receding limb of unit hydrograph: $Tr = \text{ratio of } T_p$

Name....

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

SCS UNIT HYDROGRAPH METHOD
(Computational Notes)

PRECIPITATION: -----

Column (1): Time for time step t
 Column (2): $D(t)$ = Point on distribution curve for time step t
 Column (3): $P_i(t) = P_a(t) - P_a(t-1)$: Col.(4) - Preceding Col.(4)
 Column (4): $P_a(t) = D(t) \times P$: Col.(2) \times P

PERVIOUS AREA RUNOFF (using SCS Runoff CN Method) -----

Column (5): $R_{ap}(t)$ = Accumulated pervious runoff for time step t
 If $(P_a(t) \leq 0.2Sp)$ then use: $R_{ap}(t) = 0.0$
 If $(P_a(t) > 0.2Sp)$ then use:

$$R_{ap}(t) = (Col.(4) - 0.2Sp)^2 / (Col.(4) + 0.8Sp)$$

Column (6): $R_{ip}(t)$ = Incremental pervious runoff for time step t
 $R_{ip}(t) = R_{ap}(t) - R_{ap}(t-1)$
 $R_{ip}(t) = Col.(5)$ for current row - $Col.(5)$ for preceding row.

IMPERVIOUS AREA RUNOFF -----

Column (7 & 8)... Did not specify to use impervious areas.

INCREMENTAL WEIGHTED RUNOFF: -----

Column (9): $R(t) = (A_p/A_t) \times R_{ip}(t) + (A_i/A_t) \times R_{ii}(t)$
 $R(t) = (A_p/A_t) \times Col.(6) + (A_i/A_t) \times Col.(8)$

SCS UNIT HYDROGRAPH METHOD: -----

Column (10): $Q(t)$ is computed with the SCS unit hydrograph method using $R(t)$ and $Q_u(t)$.

Name.... PRE WATERSHED A Tag: 1

Event: 1 yr

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

Storm... TypeIII 24hr Tag: 1

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm

Duration = 24.0000 hrs Rain Depth = 2.9000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = - PRE WATERSHED A 1
 Tc = .4604 hrs
 Drainage Area = 193.480 acres Runoff CN= 80

=====
 Computational Time Increment = .06139 hrs
 Computed Peak Time = 12.3384 hrs
 Computed Peak Flow = 151.59 cfs

Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.3500 hrs
 Peak Flow, Interpolated Output = 151.01 cfs
 =====

DRAINAGE AREA

 ID:PRE WATERSHED A
 CN = 80
 Area = 193.480 acres
 S = 2.5000 in
 0.2S = .5000 in

Cumulative Runoff

 1.1755 in
 18.953 ac-ft

HYG Volume... 18.954 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .46039 hrs (ID: PRE WATERSHED A)
 Computational Incr, Tm = .06139 hrs = 0.20000 Tp
 Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)
 Unit peak, qp = 476.16 cfs
 Unit peak time Tp = .30693 hrs
 Unit receding limb, Tr = 1.22771 hrs
 Total unit time, Tb = 1.53463 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
 Duration = 24.0000 hrs Rain Depth = 5.5000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = - PRE WATERSHED A 10
 Tc = .4604 hrs
 Drainage Area = 193.480 acres Runoff CN= 80

=====
 Computational Time Increment = .06139 hrs
 Computed Peak Time = 12.3384 hrs
 Computed Peak Flow = 437.82 cfs

Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.3500 hrs
 Peak Flow, Interpolated Output = 434.54 cfs
 =====

DRAINAGE AREA

 ID:PRE WATERSHED A
 CN = 80
 Area = 193.480 acres
 S = 2.5000 in
 0.2S = .5000 in

Cumulative Runoff

 3.3333 in
 53.744 ac-ft

HYG Volume... 53.746 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .46039 hrs (ID: PRE WATERSHED A)
 Computational Incr, Tm = .06139 hrs = 0.20000 Tp
 Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)
 Unit peak, qp = 476.16 cfs
 Unit peak time Tp = .30693 hrs
 Unit receding limb, Tr = 1.22771 hrs
 Total unit time, Tb = 1.53463 hrs

Name.... PRE WATERSHED A Tag: 100

Event: 100 yr

File.... T:\Land Projects R2\020042TRI\PondPack files\PRE-DEV EXM.PPW

Storm... TypeIII 24hr Tag: 100

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm

Duration = 24.0000 hrs Rain Depth = 8.0000 in
Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
Rain File -ID = - TypeIII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
HYG File - ID = - PRE WATERSHED A 100
Tc = .4604 hrs
Drainage Area = 193.480 acres Runoff CN= 80

Computational Time Increment = .06139 hrs
Computed Peak Time = 12.3384 hrs
Computed Peak Flow = 728.79 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.3000 hrs
Peak Flow, Interpolated Output = 725.68 cfs

DRAINAGE AREA

ID:PRE WATERSHED A
CN = 80
Area = 193.480 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

5.6250 in
90.694 ac-ft

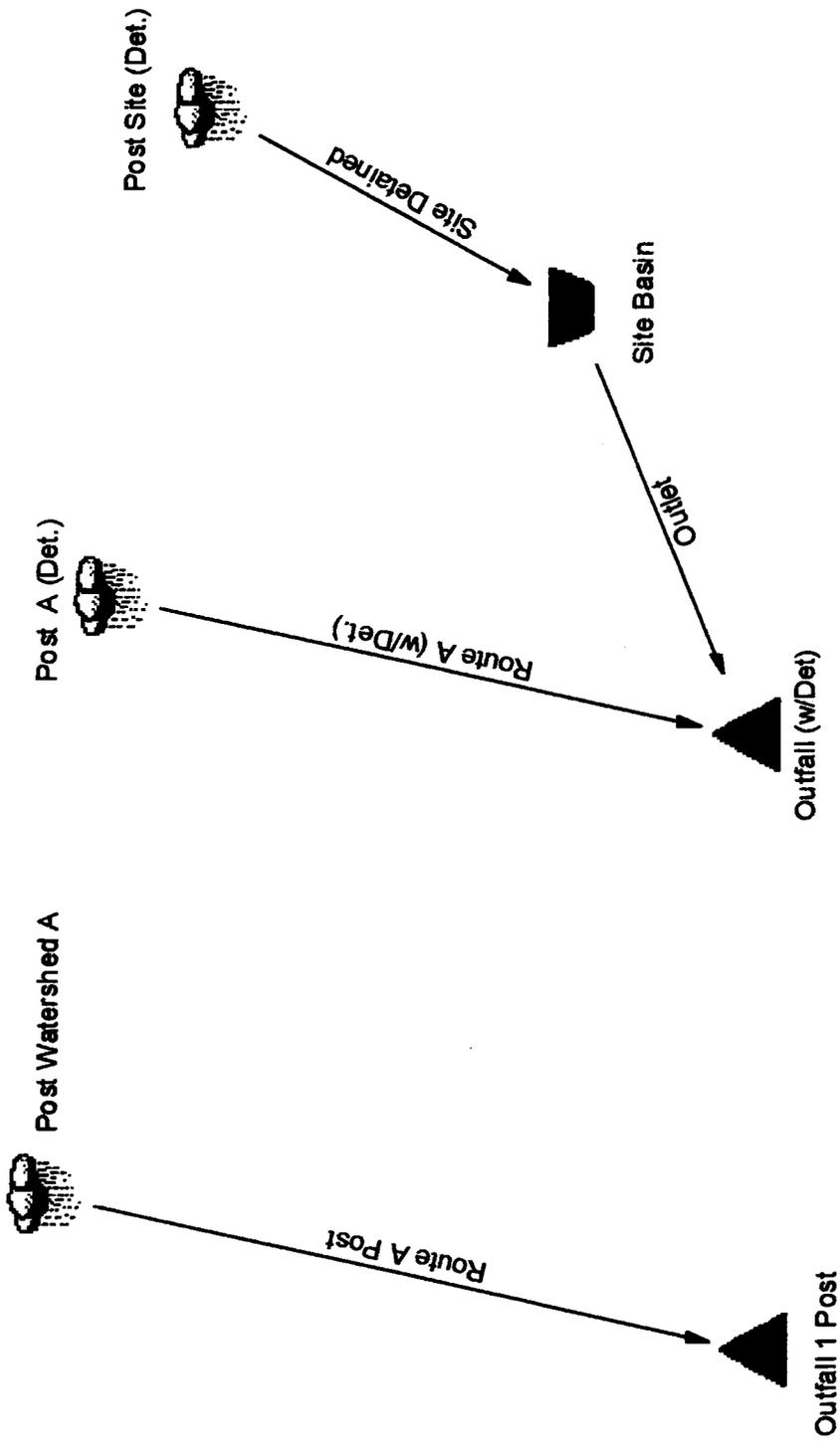
HYG Volume... 90.696 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .46039 hrs (ID: PRE WATERSHED A)
Computational Incr, Tm = .06139 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 476.16 cfs
Unit peak time Tp = .30693 hrs
Unit receding limb, Tr = 1.22771 hrs
Total unit time, Tb = 1.53463 hrs



Job File: T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
Rain Dir: T:\Land Projects R2\020042TRI\PondPack files\

=====
JOB TITLE
=====

Project Date: 12/14/2004
Project Engineer: Lorraine Potter
Project Title: Covered Bridge at Golden Triangle
Project Comments:
Post Development Conditions
Downstream Analysis
90 UnitTownhouse Development
Town of Wallkill, Orange County

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MASTER DESIGN STORM SUMMARY

Network Storm Collection: Orange County

Return Event	Total Depth in	Rainfall Type	RNF ID
1	2.9000	Synthetic Curve	TypeIII 24hr
10	5.5000	Synthetic Curve	TypeIII 24hr
100	8.0000	Synthetic Curve	TypeIII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*OUTFALL (W/DET)	JCT	1	19.266		12.3000	163.44		
*OUTFALL (W/DET)	JCT	10	54.230		12.3000	466.37		
*OUTFALL (W/DET)	JCT	100	91.272		12.2500	774.72		
*OUTFALL 1 POST	JCT	1	18.956		12.3000	159.26		
*OUTFALL 1 POST	JCT	10	53.750		12.3000	459.73		
*OUTFALL 1 POST	JCT	100	90.700		12.3000	765.03		
POST A (DET.)	AREA	1	17.048		12.3000	143.22		
POST A (DET.)	AREA	10	48.338		12.3000	413.44		
POST A (DET.)	AREA	100	81.568		12.3000	688.00		
POST SITE (DET.)	AREA	1	2.218		12.2000	21.88		
POST SITE (DET.)	AREA	10	5.893		12.2000	58.05		
POST SITE (DET.)	AREA	100	9.704		12.2000	93.82		
POST WATERSHED A	AREA	1	18.956		12.3000	159.26		
POST WATERSHED A	AREA	10	53.750		12.3000	459.73		
POST WATERSHED A	AREA	100	90.700		12.3000	765.03		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
SITE BASIN	IN	POND 1	2.218		12.2000	21.88		
SITE BASIN	IN	POND 10	5.893		12.2000	58.05		
SITE BASIN	IN	POND 100	9.704		12.2000	93.82		
SITE BASIN	OUT	POND 1	2.218		12.3000	20.21	102.28	.163
SITE BASIN	OUT	POND 10	5.892		12.2500	53.15	104.27	.368
SITE BASIN	OUT	POND 100	9.703		12.2500	90.43	106.35	.624

Type.... Executive Summary (Nodes)
 Name.... Watershed
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

Page 2.01
 Event: 1 yr

NETWORK SUMMARY -- NODES
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 1

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 1 yr
 Total Rainfall Depth= 2.9000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Qpeak Trun. hrs	Qpeak cfs	Max WSEL ft
Outfall	OUTFALL (W/DET)	JCT	19.266	12.3000	163.44
Outfall	OUTFALL 1 POST	JCT	18.956	12.3000	159.26
	POST A (DET.)	AREA	17.048	12.3000	143.22
	POST SITE (DET.)	AREA	2.218	12.2000	21.88
	POST WATERSHED A	AREA	18.956	12.3000	159.26
	SITE BASIN IN	POND	2.218	12.2000	21.88
	SITE BASIN OUT	POND	2.218	12.3000	20.21
					102.28

NETWORK SUMMARY -- LINKS
 (UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 1

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 1 yr
 Total Rainfall Depth= 2.9000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type	HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points
OUTLET	PONDrt UN	2.218		12.2000	21.88	SITE BASIN IN
OUTLET	DL	2.218		12.3000	20.21	SITE BASIN OUT
	DN	19.266		12.3000	163.44	OUTFALL (W/DET)
ROUTE A (W/DET.)	ADD UN	17.048		12.3000	143.22	POST A (DET.)
	DL	17.048		12.3000	143.22	
	DN	19.266		12.3000	163.44	OUTFALL (W/DET)
ROUTE A POST	ADD UN	18.956		12.3000	159.26	POST WATERSHED A
	DL	18.956		12.3000	159.26	
	DN	18.956		12.3000	159.26	OUTFALL 1 POST
SITE DETAINED	ADD UN	2.218		12.2000	21.88	POST SITE (DET.)
	DL	2.218		12.2000	21.88	
	DN	2.218		12.2000	21.88	SITE BASIN IN

Type.... Executive Summary (Nodes) Page 2.03
 Name.... Watershed Event: 10 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 10

NETWORK SUMMARY -- NODES
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 10

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 10 yr
 Total Rainfall Depth= 5.5000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Qpeak Trun. hrs	Qpeak cfs	Max WSEL ft
Outfall	OUTFALL (W/DET)	JCT	54.230	12.3000	466.37
Outfall	OUTFALL 1 POST	JCT	53.750	12.3000	459.73
	POST A (DET.)	AREA	48.338	12.3000	413.44
	POST SITE (DET.)	AREA	5.893	12.2000	58.05
	POST WATERSHED A	AREA	53.750	12.3000	459.73
	SITE BASIN IN	POND	5.893	12.2000	58.05
	SITE BASIN OUT	POND	5.892	12.2500	53.15
					104.27

NETWORK SUMMARY -- LINKS
 (UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 10

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 10 yr
 Total Rainfall Depth= 5.5000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Peak Time Trun. hrs	Peak Q cfs	End Points
OUTLET	PONDrt UN		5.893	12.2000	58.05	SITE BASIN IN
OUTLET		DL	5.892	12.2500	53.15	SITE BASIN OUT
		DN	54.230	12.3000	466.37	OUTFALL (W/DET)
ROUTE A (W/DET.)	ADD UN		48.338	12.3000	413.44	POST A (DET.)
		DL	48.338	12.3000	413.44	
		DN	54.230	12.3000	466.37	OUTFALL (W/DET)
ROUTE A POST	ADD UN		53.750	12.3000	459.73	POST WATERSHED A
		DL	53.750	12.3000	459.73	
		DN	53.750	12.3000	459.73	OUTFALL 1 POST
SITE DETAINED	ADD UN		5.893	12.2000	58.05	POST SITE (DET.)
		DL	5.893	12.2000	58.05	
		DN	5.893	12.2000	58.05	SITE BASIN IN

Type.... Executive Summary (Nodes) Page 2.05
 Name.... Watershed Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

NETWORK SUMMARY -- NODES
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 100

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 100 yr
 Total Rainfall Depth= 8.0000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Qpeak Trun. hrs	Qpeak cfs	Max WSEL ft
Outfall	OUTFALL (W/DET)	JCT	91.272	12.2500	774.72
Outfall	OUTFALL 1 POST	JCT	90.700	12.3000	765.03
	POST A (DET.)	AREA	81.568	12.3000	688.00
	POST SITE (DET.)	AREA	9.704	12.2000	93.82
	POST WATERSHED A	AREA	90.700	12.3000	765.03
	SITE BASIN IN	POND	9.704	12.2000	93.82
	SITE BASIN OUT	POND	9.703	12.2500	90.43
					106.35

Type.... Executive Summary (Links) Page 2.06
 Name.... Watershed Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

NETWORK SUMMARY -- LINKS
 (UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
 (Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File, ID = Orange County

Storm Tag Name = 100

 Data Type, File, ID = Synthetic Storm TypeIII 24hr
 Storm Frequency = 100 yr
 Total Rainfall Depth= 8.0000 in
 Duration Multiplier = 1
 Resulting Duration = 24.0000 hrs
 Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points
OUTLET	PONDrt UN		9.704		12.2000	93.82	SITE BASIN IN
OUTLET			9.703		12.2500	90.43	SITE BASIN OUT
	DL		9.703		12.2500	90.43	
	DN		91.272		12.2500	774.72	OUTFALL (W/DET)
ROUTE A (W/DET.)	ADD UN		81.568		12.3000	688.00	POST A (DET.)
	DL		81.568		12.3000	688.00	
	DN		91.272		12.2500	774.72	OUTFALL (W/DET)
ROUTE A POST	ADD UN		90.700		12.3000	765.03	POST WATERSHED A
	DL		90.700		12.3000	765.03	
	DN		90.700		12.3000	765.03	OUTFALL 1 POST
SITE DETAINED	ADD UN		9.704		12.2000	93.82	POST SITE (DET.)
	DL		9.704		12.2000	93.82	
	DN		9.704		12.2000	93.82	SITE BASIN IN

Type.... Network Calcs Sequence

Page 2.07

Name.... Watershed

Event: 100 yr

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

Storm... TypeIII 24hr Tag: 100

NETWORK RUNOFF NODE SEQUENCE

```

=====
Runoff Data          Apply to Node          Receiving Link
=====
SCS UH  POST WATERSHED A Subarea  POST WATERSHED A Add Hyd  POST WATERSHED A
SCS UH  POST A (DET.) Subarea  POST A (DET.) Add Hyd  POST A (DET.)
SCS UH  POST SITE (DET.) Subarea  POST SITE (DET.) Add Hyd  POST SITE (DET.)
=====

```

NETWORK ROUTING SEQUENCE

```

=====
Link Operation          UPstream Node          DNstream Node
=====
Add Hyd SITE DETAINED  Subarea POST SITE (DET.) Pond SITE BASIN IN

POND ROUTE TOTAL OUTFLOW...
Total Pond Outflow     Pond SITE BASIN IN Outflow SITE BASIN OUT

SET POND ROUTING LINK TO TOTAL POND OUTFLOW...
Outlet OUTLET         Outflow SITE BASIN OUT Jct OUTFALL (W/DET)

Add Hyd ROUTE A (W/DET.) Subarea POST A (DET.) Jct OUTFALL (W/DET)

Add Hyd ROUTE A POST   Subarea POST WATERSHED A Jct OUTFALL 1 POST

```

Type.... Design Storms
Name.... Orange County

File.... T:\Land Projects R2\020042TRI\PondPack files\
Title... Project Date: 12/14/2004
Project Engineer: Lorraine Potter
Project Title: Covered Bridge at Golden Triangle
Project Comments:
Post Development Conditions
Downstream Analysis
90 UnitTownhouse Development
Town of Wallkill, Orange County

DESIGN STORMS SUMMARY

Design Storm File, ID = Orange County

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 8.0000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Type.... Design Storms
Name.... Orange County
File.... T:\Land Projects R2\020042TRI\PondPack files\
Storm... TypeIII 24hr Tag: 1

Page 3.02
Event: 1 yr

DESIGN STORMS SUMMARY

Design Storm File, ID = Orange County

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 8.0000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

.....
TIME OF CONCENTRATION CALCULATOR
.....

Segment #1: Tc: TR-55 Sheet

Mannings n .2400
Hydraulic Length 100.00 ft
2yr, 24hr P 3.5000 in
Slope .050000 ft/ft

Avg.Velocity .18 ft/sec

Segment #1 Time: .1576 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length 1570.00 ft
Slope .040000 ft/ft
Unpaved

Avg.Velocity 3.23 ft/sec

Segment #2 Time: .1351 hrs

Segment #3: Tc: TR-55 Channel

Flow Area 8.0000 sq.ft
Wetted Perimeter 10.00 ft
Hydraulic Radius .80 ft
Slope .020000 ft/ft
Mannings n .0270
Hydraulic Length 2700.00 ft

Avg.Velocity 6.73 ft/sec

Segment #3 Time: .1115 hrs

=====
Total Tc: .4043 hrs
=====

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

Tc Equations used...

==== SCS TR-55 Sheet Flow =====

$$Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))$$

Where: Tc = Time of concentration, hrs
n = Mannings n
Lf = Flow length, ft
P = 2yr, 24hr Rain depth, inches
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow =====

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved surface:
V = 20.3282 * (Sf**0.5)

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: V = Velocity, ft/sec
Sf = Slope, ft/ft
Tc = Time of concentration, hrs
Lf = Flow length, ft

Type.... Tc Calcs
Name.... POST A (DET.)

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

==== SCS Channel Flow =====

$$R = Aq / Wp$$
$$V = (1.49 * (R^{2/3}) * (Sf^{*-0.5})) / n$$
$$Tc = (Lf / V) / (3600\text{sec/hr})$$

Where: R = Hydraulic radius
Aq = Flow area, sq.ft.
Wp = Wetted perimeter, ft
V = Velocity, ft/sec
Sf = Slope, ft/ft
n = Mannings n
Tc = Time of concentration, hrs
Lf = Flow length, ft

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

.....
TIME OF CONCENTRATION CALCULATOR
.....

Segment #1: Tc: TR-55 Sheet

Mannings n .2400
Hydraulic Length 100.00 ft
2yr, 24hr P 3.5000 in
Slope .030000 ft/ft

Avg.Velocity .14 ft/sec

Segment #1 Time: .1934 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length 400.00 ft
Slope .050000 ft/ft
Unpaved

Avg.Velocity 3.61 ft/sec

Segment #2 Time: .0308 hrs

Segment #3: Tc: TR-55 Shallow

Hydraulic Length 200.00 ft
Slope .020000 ft/ft
Unpaved

Avg.Velocity 2.28 ft/sec

Segment #3 Time: .0243 hrs

Type.... Tc Calcs
Name.... POST SITE (DET.)

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

Segment #4: Tc: TR-55 Channel

Flow Area 8.0000 sq.ft
Wetted Perimeter 10.00 ft
Hydraulic Radius .80 ft
Slope .015000 ft/ft
Mannings n .0270
Hydraulic Length 513.00 ft

Avg.Velocity 5.82 ft/sec

Segment #4 Time: .0245 hrs

=====
Total Tc: .2730 hrs
=====

Type.... Tc Calcs
Name.... POST SITE (DET.)

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

Tc Equations used...

==== SCS TR-55 Sheet Flow =====

$$Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))$$

Where: Tc = Time of concentration, hrs
n = Mannings n
Lf = Flow length, ft
P = 2yr, 24hr Rain depth, inches
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow =====

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved surface:
V = 20.3282 * (Sf**0.5)

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: V = Velocity, ft/sec
Sf = Slope, ft/ft
Tc = Time of concentration, hrs
Lf = Flow length, ft

Type.... Tc Calcs
Name.... POST SITE (DET.)

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

==== SCS Channel Flow =====

$$R = Aq / Wp$$
$$V = (1.49 * (R^{2/3}) * (Sf^{-0.5})) / n$$

$$Tc = (Lf / V) / (3600\text{sec/hr})$$

Where: R = Hydraulic radius
Aq = Flow area, sq.ft.
Wp = Wetted perimeter, ft
V = Velocity, ft/sec
Sf = Slope, ft/ft
n = Mannings n
Tc = Time of concentration, hrs
Lf = Flow length, ft

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: TR-55 Sheet

Mannings n .2400
Hydraulic Length 100.00 ft
2yr, 24hr P 3.5000 in
Slope .050000 ft/ft

Avg.Velocity .18 ft/sec

Segment #1 Time: .1576 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length 1570.00 ft
Slope .040000 ft/ft
Unpaved

Avg.Velocity 3.23 ft/sec

Segment #2 Time: .1351 hrs

Segment #3: Tc: TR-55 Channel

Flow Area 8.0000 sq.ft
Wetted Perimeter 10.00 ft
Hydraulic Radius .80 ft
Slope .020000 ft/ft
Mannings n .0270
Hydraulic Length 2700.00 ft

Avg.Velocity 6.73 ft/sec

Segment #3 Time: .1115 hrs

=====
Total Tc: .4043 hrs
=====

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

Tc Equations used..

==== SCS TR-55 Sheet Flow =====

$$Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))$$

Where: Tc = Time of concentration, hrs
n = Mannings n
Lf = Flow length, ft
P = 2yr, 24hr Rain depth, inches
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow =====

Unpaved surface:

$$V = 16.1345 * (Sf**0.5)$$

Paved surface:

$$V = 20.3282 * (Sf**0.5)$$

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: V = Velocity, ft/sec
Sf = Slope, ft/ft
Tc = Time of concentration, hrs
Lf = Flow length, ft

Type.... Tc Calcs
Name.... POST WATERSHED A

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

==== SCS Channel Flow =====

$$R = Aq / Wp$$
$$V = (1.49 * (R^{2/3}) * (Sf^{-0.5})) / n$$

$$Tc = (Lf / V) / (3600\text{sec/hr})$$

Where: R = Hydraulic radius
Aq = Flow area, sq.ft.
Wp = Wetted perimeter, ft
V = Velocity, ft/sec
Sf = Slope, ft/ft
n = Mannings n
Tc = Time of concentration, hrs
Lf = Flow length, ft

Type.... Runoff CN-Area
Name.... POST A (DET.)

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

RUNOFF CURVE NUMBER DATA

.....

Soil/Surface Description	CN	Area acres	Impervious Adjustment		Adjusted CN
			%C	%UC	
Residential Districts - 1/4 acre	83	84.000			83.00
Urban Districts - Commercial & Busi	94	20.000			94.00
Woods - fair	73	70.000			73.00

COMPOSITE AREA & WEIGHTED CN ---> 174.000 80.24 (80)

.....

Type.... Runoff CN-Area
Name.... POST SITE (DET.)

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

RUNOFF CURVE NUMBER DATA

.....

Soil/Surface Description	CN	Area acres	Impervious Adjustment		Adjusted CN
			%C	%UC	
Woods - fair	73	5.720			73.00
Open space (Lawns,parks etc.) - Goo	74	4.960			74.00
Impervious Areas - Paved parking lo	98	6.800			98.00
Woods - fair	79	2.000			79.00

COMPOSITE AREA & WEIGHTED CN ---> 19.480 82.60 (83)
.....

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

RUNOFF CURVE NUMBER DATA

.....

Soil/Surface Description	CN	Area acres	Impervious Adjustment		Adjusted CN
			%C	%UC	
Residential Districts - 1/4 acre	83	84.000			83.00
Commercial & Business Areas	94	20.000			94.00
Wooded-C Soils	73	74.240			73.00
Wooded D Soils	79	2.000			79.00
Impervious Areas - Paved parking lo	98	6.800			98.00
Open space Lawns Good condition; gr	74	6.440			74.00
COMPOSITE AREA & WEIGHTED CN --->		193.480			80.49 (80)

.....

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
 Duration = 24.0000 hrs Rain Depth = 5.5000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST SITE (DET.) 10
 Tc = .2730 hrs
 Drainage Area = 19.480 acres Runoff CN= 83

=====
 Computational Time Increment = .03640 hrs
 Computed Peak Time = 12.1931 hrs
 Computed Peak Flow = 58.30 cfs

Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.2000 hrs
 Peak Flow, Interpolated Output = 58.05 cfs
 =====

DRAINAGE AREA

 ID:POST SITE (DET.)
 CN = 83
 Area = 19.480 acres
 S = 2.0482 in
 0.2S = .4096 in

Cumulative Runoff

 3.6298 in
 5.892 ac-ft

HYG Volume... 5.893 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .27298 hrs (ID: POST SITE (DET.))
 Computational Incr, Tm = .03640 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 80.85 cfs
 Unit peak time Tp = .18199 hrs
 Unit receding limb, Tr = .72794 hrs
 Total unit time, Tb = .90993 hrs

Type.... Unit Hyd. (HYG output) Page 6.02
 Name.... POST SITE (DET.) Tag: 10 Event: 10 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 10

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
 Duration = 24.0000 hrs Rain Depth = 5.5000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST SITE (DET.) 10
 Tc = .2730 hrs
 Drainage Area = 19.480 acres Runoff CN= 83
 Calc.Increment= .03640 hrs Out.Incr.= .0500 hrs
 HYG Volume = 5.893 ac-ft

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
6.2500	.00	.00	.01	.01	.02
6.5000	.03	.03	.04	.05	.06
6.7500	.07	.08	.09	.11	.12
7.0000	.13	.14	.15	.17	.18
7.2500	.19	.21	.22	.24	.25
7.5000	.27	.28	.30	.31	.33
7.7500	.35	.36	.38	.40	.41
8.0000	.43	.45	.47	.49	.51
8.2500	.54	.56	.59	.62	.65
8.5000	.68	.71	.74	.77	.80
8.7500	.84	.87	.91	.95	.98
9.0000	1.02	1.06	1.10	1.14	1.19
9.2500	1.23	1.27	1.32	1.36	1.41
9.5000	1.45	1.50	1.55	1.60	1.65
9.7500	1.70	1.75	1.80	1.85	1.90
10.0000	1.96	2.01	2.07	2.14	2.20
10.2500	2.28	2.36	2.44	2.53	2.62
10.5000	2.72	2.81	2.91	3.01	3.11
10.7500	3.21	3.31	3.42	3.53	3.64
11.0000	3.75	3.87	4.00	4.17	4.37
11.2500	4.62	4.89	5.20	5.52	5.86
11.5000	6.21	6.66	7.33	8.37	9.93
11.7500	12.01	14.54	17.49	20.74	25.14
12.0000	31.65	40.39	49.33	56.09	58.05
12.2500	55.18	49.98	44.06	38.69	33.85
12.5000	29.39	25.17	21.38	18.13	15.51
12.7500	13.58	12.14	11.06	10.23	9.54
13.0000	8.96	8.46	8.01	7.62	7.31
13.2500	7.06	6.86	6.70	6.55	6.42
13.5000	6.30	6.19	6.07	5.96	5.85

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
13.7500	5.73	5.62	5.51	5.40	5.29
14.0000	5.18	5.07	4.97	4.87	4.78
14.2500	4.70	4.64	4.57	4.51	4.46
14.5000	4.40	4.35	4.29	4.24	4.19
14.7500	4.13	4.08	4.02	3.97	3.92
15.0000	3.86	3.81	3.75	3.70	3.65
15.2500	3.59	3.54	3.48	3.43	3.37
15.5000	3.32	3.26	3.21	3.15	3.10
15.7500	3.05	2.99	2.94	2.88	2.83
16.0000	2.77	2.72	2.67	2.62	2.58
16.2500	2.54	2.51	2.48	2.45	2.42
16.5000	2.40	2.37	2.35	2.32	2.30
16.7500	2.28	2.25	2.23	2.20	2.18
17.0000	2.16	2.13	2.11	2.08	2.06
17.2500	2.04	2.01	1.99	1.96	1.94
17.5000	1.92	1.89	1.87	1.84	1.82
17.7500	1.80	1.77	1.75	1.72	1.70
18.0000	1.67	1.65	1.63	1.61	1.59
18.2500	1.58	1.56	1.55	1.55	1.54
18.5000	1.53	1.52	1.51	1.51	1.50
18.7500	1.49	1.49	1.48	1.47	1.46
19.0000	1.46	1.45	1.44	1.44	1.43
19.2500	1.42	1.41	1.41	1.40	1.39
19.5000	1.38	1.38	1.37	1.36	1.36
19.7500	1.35	1.34	1.33	1.33	1.32
20.0000	1.31	1.30	1.30	1.29	1.28
20.2500	1.28	1.27	1.27	1.26	1.26
20.5000	1.25	1.24	1.24	1.23	1.23
20.7500	1.22	1.22	1.21	1.21	1.20
21.0000	1.20	1.19	1.19	1.18	1.17
21.2500	1.17	1.16	1.16	1.15	1.15
21.5000	1.14	1.13	1.13	1.12	1.12
21.7500	1.11	1.11	1.10	1.10	1.09
22.0000	1.09	1.08	1.08	1.07	1.07
22.2500	1.06	1.05	1.05	1.04	1.04
22.5000	1.03	1.03	1.02	1.02	1.01
22.7500	1.01	1.00	.99	.99	.98
23.0000	.98	.97	.97	.96	.95
23.2500	.95	.94	.94	.93	.93
23.5000	.92	.92	.91	.91	.90
23.7500	.89	.89	.88	.88	.87
24.0000	.86	.83	.74	.58	.41
24.2500	.27	.17	.11	.07	.04
24.5000	.03	.02	.01	.01	.00
24.7500	.00	.00			

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
 Duration = 24.0000 hrs Rain Depth = 8.0000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST SITE (DET.) 100
 Tc = .2730 hrs
 Drainage Area = 19.480 acres Runoff CN= 83

=====
 Computational Time Increment = .03640 hrs
 Computed Peak Time = 12.1931 hrs
 Computed Peak Flow = 94.31 cfs

Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.2000 hrs
 Peak Flow, Interpolated Output = 93.82 cfs
 =====

DRAINAGE AREA

 ID:POST SITE (DET.)
 CN = 83
 Area = 19.480 acres
 S = 2.0482 in
 0.2S = .4096 in

Cumulative Runoff

 5.9774 in
 9.703 ac-ft

HYG Volume... 9.704 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .27298 hrs (ID: POST SITE (DET.))
 Computational Incr, Tm = .03640 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 80.85 cfs
 Unit peak time Tp = .18199 hrs
 Unit receding limb, Tr = .72794 hrs
 Total unit time, Tb = .90993 hrs

Type.... Unit Hyd. (HYG output) Page 6.05
 Name.... POST SITE (DET.) Tag: 100 Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
 Duration = 24.0000 hrs Rain Depth = 8.0000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST SITE (DET.) 100
 Tc = .2730 hrs
 Drainage Area = 19.480 acres Runoff CN= 83
 Calc.Increment= .03640 hrs Out.Incr.= .0500 hrs
 HYG Volume = 9.704 ac-ft

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
4.7000	.00	.00	.01	.01	.02
4.9500	.03	.04	.06	.07	.08
5.2000	.09	.10	.12	.13	.14
5.4500	.16	.17	.18	.19	.21
5.7000	.22	.23	.25	.26	.28
5.9500	.29	.30	.32	.33	.35
6.2000	.36	.38	.40	.42	.44
6.4500	.46	.48	.50	.52	.54
6.7000	.56	.59	.61	.63	.66
6.9500	.68	.71	.73	.76	.79
7.2000	.81	.84	.87	.90	.92
7.4500	.95	.98	1.01	1.04	1.07
7.7000	1.11	1.14	1.17	1.20	1.23
7.9500	1.27	1.30	1.34	1.37	1.41
8.2000	1.46	1.50	1.55	1.61	1.66
8.4500	1.72	1.78	1.84	1.90	1.96
8.7000	2.03	2.09	2.16	2.23	2.29
8.9500	2.36	2.43	2.51	2.58	2.65
9.2000	2.73	2.80	2.88	2.96	3.04
9.4500	3.12	3.20	3.28	3.36	3.45
9.7000	3.53	3.62	3.70	3.79	3.88
9.9500	3.96	4.05	4.14	4.24	4.35
10.2000	4.46	4.59	4.73	4.87	5.02
10.4500	5.18	5.34	5.50	5.66	5.83
10.7000	6.00	6.17	6.34	6.51	6.69
10.9500	6.87	7.05	7.24	7.46	7.74
11.2000	8.08	8.49	8.96	9.48	10.02
11.4500	10.59	11.18	11.93	13.06	14.83
11.7000	17.49	21.01	25.27	30.16	35.47
11.9500	42.59	53.05	66.99	80.99	91.31

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
12.2000	93.82	88.65	79.86	70.08	61.29
12.4500	53.42	46.25	39.51	33.48	28.34
12.7000	24.19	21.15	18.89	17.17	15.88
12.9500	14.79	13.89	13.09	12.39	11.79
13.2000	11.30	10.90	10.60	10.34	10.11
13.4500	9.91	9.72	9.53	9.35	9.18
13.7000	9.00	8.83	8.65	8.48	8.31
13.9500	8.14	7.96	7.79	7.63	7.48
14.2000	7.34	7.22	7.12	7.02	6.92
14.4500	6.84	6.75	6.66	6.58	6.50
14.7000	6.41	6.33	6.24	6.16	6.08
14.9500	5.99	5.91	5.83	5.74	5.66
15.2000	5.58	5.49	5.41	5.32	5.24
15.4500	5.16	5.07	4.99	4.90	4.82
15.7000	4.73	4.65	4.57	4.48	4.40
15.9500	4.31	4.23	4.14	4.07	3.99
16.2000	3.93	3.87	3.82	3.78	3.74
16.4500	3.69	3.66	3.62	3.58	3.54
16.7000	3.51	3.47	3.43	3.40	3.36
16.9500	3.32	3.29	3.25	3.21	3.17
17.2000	3.14	3.10	3.06	3.03	2.99
17.4500	2.95	2.92	2.88	2.84	2.81
17.7000	2.77	2.73	2.69	2.66	2.62
17.9500	2.58	2.55	2.51	2.47	2.44
18.2000	2.42	2.40	2.38	2.36	2.35
18.4500	2.34	2.33	2.31	2.30	2.29
18.7000	2.28	2.27	2.26	2.25	2.24
18.9500	2.22	2.21	2.20	2.19	2.18
19.2000	2.17	2.16	2.15	2.14	2.12
19.4500	2.11	2.10	2.09	2.08	2.07
19.7000	2.06	2.05	2.04	2.03	2.01
19.9500	2.00	1.99	1.98	1.97	1.96
20.2000	1.95	1.94	1.93	1.92	1.91
20.4500	1.91	1.90	1.89	1.88	1.87
20.7000	1.86	1.85	1.84	1.84	1.83
20.9500	1.82	1.81	1.81	1.80	1.79
21.2000	1.78	1.77	1.76	1.76	1.75
21.4500	1.74	1.73	1.72	1.71	1.70
21.7000	1.70	1.69	1.68	1.67	1.67
21.9500	1.66	1.65	1.64	1.63	1.62
22.2000	1.61	1.61	1.60	1.59	1.58
22.4500	1.57	1.56	1.55	1.55	1.54
22.7000	1.53	1.52	1.51	1.50	1.50
22.9500	1.49	1.48	1.47	1.46	1.45
23.2000	1.44	1.44	1.43	1.42	1.41

Type.... Unit Hyd. (HYG output) Page 6.07
 Name.... POST SITE (DET.) Tag: 100 Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

HYDROGRAPH ORDINATES (cfs)

Output Time increment = .0500 hrs

Time on left represents time for first value in each row.

Time hrs					
23.4500	1.41	1.40	1.39	1.38	1.37
23.7000	1.36	1.35	1.35	1.34	1.33
23.9500	1.32	1.31	1.26	1.12	.88
24.2000	.62	.41	.26	.16	.10
24.4500	.07	.04	.03	.02	.01
24.7000	.01	.00	.00	.00	

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
 Duration = 24.0000 hrs Rain Depth = 2.9000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST WATERSHED A 1
 Tc = .4043 hrs
 Drainage Area = 193.480 acres Runoff CN= 80

=====
 Computational Time Increment = .05391 hrs
 Computed Peak Time = 12.2906 hrs
 Computed Peak Flow = 159.60 cfs

Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.3000 hrs
 Peak Flow, Interpolated Output = 159.26 cfs
 =====

DRAINAGE AREA

 ID:POST WATERSHED A
 CN = 80
 Area = 193.480 acres
 S = 2.5000 in
 0.2S = .5000 in

Cumulative Runoff

 1.1755 in
 18.953 ac-ft

HYG Volume... 18.956 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .40430 hrs (ID: POST WATERSHED A)
 Computational Incr, Tm = .05391 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 542.23 cfs
 Unit peak time Tp = .26953 hrs
 Unit receding limb, Tr = 1.07812 hrs
 Total unit time, Tb = 1.34765 hrs

Type.... Unit Hyd. (HYG output) Page 6.09
 Name.... POST WATERSHED A Tag: 1 Event: 1 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
 Duration = 24.0000 hrs Rain Depth = 2.9000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST WATERSHED A 1
 Tc = .4043 hrs
 Drainage Area = 193.480 acres Runoff CN= 80
 Calc.Increment= .05391 hrs Out.Incr.= .0500 hrs
 HYG Volume = 18.956 ac-ft

HYDROGRAPH ORDINATES (cfs)

Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs	0.00	0.05	0.10	0.15	0.20
9.6500	.00	.00	.01	.02	.05
9.9000	.10	.16	.25	.35	.47
10.1500	.59	.73	.88	1.04	1.21
10.4000	1.40	1.59	1.79	2.01	2.23
10.6500	2.47	2.71	2.97	3.23	3.51
10.9000	3.79	4.09	4.39	4.71	5.06
11.1500	5.43	5.85	6.34	6.88	7.50
11.4000	8.18	8.93	9.77	10.73	11.94
11.6500	13.59	15.89	19.17	23.59	29.33
11.9000	36.56	46.26	59.54	77.39	99.03
12.1500	121.56	141.12	154.22	159.26	156.84
12.4000	149.31	138.50	126.56	114.31	102.16
12.6500	90.43	79.59	70.05	62.00	55.42
12.9000	50.09	45.78	42.20	39.18	36.57
13.1500	34.34	32.41	30.77	29.39	28.25
13.4000	27.31	26.53	25.86	25.27	24.74
13.6500	24.24	23.78	23.34	22.92	22.50
13.9000	22.08	21.66	21.25	20.83	20.43
14.1500	20.04	19.67	19.32	19.01	18.73
14.4000	18.47	18.22	17.99	17.77	17.56
14.6500	17.35	17.14	16.93	16.73	16.52
14.9000	16.32	16.12	15.91	15.71	15.51
15.1500	15.30	15.10	14.89	14.69	14.48
15.4000	14.27	14.06	13.85	13.63	13.42
15.6500	13.21	13.00	12.79	12.57	12.36
15.9000	12.14	11.93	11.71	11.50	11.28
16.1500	11.08	10.89	10.71	10.55	10.40
16.4000	10.27	10.15	10.03	9.93	9.82
16.6500	9.72	9.62	9.52	9.42	9.33
16.9000	9.23	9.13	9.04	8.94	8.85

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
17.1500	8.75	8.66	8.56	8.47	8.37
17.4000	8.28	8.18	8.08	7.99	7.89
17.6500	7.79	7.70	7.60	7.50	7.40
17.9000	7.31	7.21	7.11	7.02	6.92
18.1500	6.83	6.74	6.67	6.60	6.54
18.4000	6.50	6.45	6.41	6.38	6.34
18.6500	6.31	6.28	6.25	6.22	6.19
18.9000	6.16	6.13	6.10	6.07	6.04
19.1500	6.01	5.99	5.96	5.93	5.90
19.4000	5.87	5.84	5.81	5.79	5.76
19.6500	5.73	5.70	5.67	5.64	5.61
19.9000	5.58	5.55	5.53	5.50	5.47
20.1500	5.44	5.41	5.39	5.36	5.34
20.4000	5.31	5.29	5.27	5.24	5.22
20.6500	5.20	5.18	5.15	5.13	5.11
20.9000	5.09	5.06	5.04	5.02	5.00
21.1500	4.98	4.96	4.94	4.92	4.89
21.4000	4.87	4.85	4.83	4.80	4.78
21.6500	4.76	4.73	4.71	4.69	4.67
21.9000	4.65	4.63	4.61	4.59	4.56
22.1500	4.54	4.52	4.49	4.47	4.45
22.4000	4.42	4.40	4.38	4.36	4.34
22.6500	4.31	4.29	4.27	4.25	4.23
22.9000	4.20	4.18	4.16	4.14	4.11
23.1500	4.09	4.07	4.04	4.02	4.00
23.4000	3.97	3.95	3.93	3.91	3.89
23.6500	3.87	3.84	3.82	3.80	3.77
23.9000	3.75	3.73	3.69	3.62	3.45
24.1500	3.14	2.70	2.20	1.72	1.29
24.4000	.95	.70	.51	.38	.28
24.6500	.20	.15	.11	.08	.06
24.9000	.04	.03	.02	.01	.01
25.1500	.01	.00	.00	.00	

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
 Duration = 24.0000 hrs Rain Depth = 5.5000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST WATERSHED A 10
 Tc = .4043 hrs
 Drainage Area = 193.480 acres Runoff CN= 80

=====
 Computational Time Increment = .05391 hrs
 Computed Peak Time = 12.2906 hrs
 Computed Peak Flow = 462.26 cfs

Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.3000 hrs
 Peak Flow, Interpolated Output = 459.73 cfs
 =====

DRAINAGE AREA

 ID:POST WATERSHED A
 CN = 80
 Area = 193.480 acres
 S = 2.5000 in
 0.2S = .5000 in

Cumulative Runoff

 3.3333 in
 53.744 ac-ft

HYG Volume... 53.750 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .40430 hrs (ID: POST WATERSHED A)
 Computational Incr, Tm = .05391 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 542.23 cfs
 Unit peak time Tp = .26953 hrs
 Unit receding limb, Tr = 1.07812 hrs
 Total unit time, Tb = 1.34765 hrs

Type.... Unit Hyd. (HYG output) Page 6.12
 Name.... POST WATERSHED A Tag: 10 Event: 10 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 10

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
 Duration = 24.0000 hrs Rain Depth = 5.5000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST WATERSHED A 10
 Tc = .4043 hrs
 Drainage Area = 193.480 acres Runoff CN= 80
 Calc.Increment= .05391 hrs Out.Incr.= .0500 hrs
 HYG Volume = 53.750 ac-ft

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
7.0500	.00	.00	.01	.03	.06
7.3000	.10	.16	.24	.32	.42
7.5500	.52	.63	.75	.87	.99
7.8000	1.12	1.25	1.39	1.53	1.67
8.0500	1.81	1.96	2.12	2.28	2.45
8.3000	2.63	2.82	3.02	3.23	3.45
8.5500	3.68	3.91	4.16	4.41	4.67
8.8000	4.94	5.22	5.50	5.80	6.10
9.0500	6.42	6.74	7.07	7.40	7.75
9.3000	8.10	8.47	8.84	9.21	9.60
9.5500	9.99	10.40	10.81	11.22	11.65
9.8000	12.08	12.53	12.98	13.44	13.90
10.0500	14.38	14.87	15.38	15.92	16.50
10.3000	17.11	17.77	18.47	19.20	19.96
10.5500	20.75	21.56	22.40	23.25	24.13
10.8000	25.03	25.94	26.88	27.83	28.80
11.0500	29.81	30.89	32.11	33.52	35.17
11.3000	37.09	39.25	41.66	44.26	47.12
11.5500	50.43	54.58	60.37	68.43	79.91
11.8000	95.09	114.17	137.38	167.27	206.59
12.0500	257.60	317.23	376.77	425.40	454.18
12.3000	459.73	444.76	416.70	381.14	344.05
12.5500	307.45	272.24	238.98	208.78	182.48
12.8000	160.47	142.55	128.09	116.42	106.78
13.0500	98.67	91.72	85.79	80.71	76.36
13.3000	72.74	69.74	67.28	65.23	63.48
13.5500	61.93	60.53	59.24	58.03	56.89
13.8000	55.78	54.69	53.62	52.55	51.49
14.0500	50.43	49.40	48.40	47.46	46.59
14.3000	45.79	45.07	44.40	43.77	43.19

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
14.5500	42.62	42.07	41.53	41.01	40.48
14.8000	39.96	39.44	38.93	38.42	37.91
15.0500	37.40	36.89	36.38	35.87	35.36
15.3000	34.85	34.33	33.82	33.30	32.78
15.5500	32.26	31.74	31.22	30.71	30.19
15.8000	29.67	29.15	28.63	28.11	27.58
16.0500	27.06	26.56	26.07	25.60	25.18
16.3000	24.79	24.43	24.11	23.82	23.54
16.5500	23.27	23.02	22.78	22.53	22.29
16.8000	22.06	21.82	21.59	21.36	21.13
17.0500	20.90	20.67	20.44	20.22	19.99
17.3000	19.76	19.53	19.30	19.07	18.84
17.5500	18.61	18.38	18.14	17.91	17.68
17.8000	17.45	17.22	16.99	16.76	16.53
18.0500	16.30	16.07	15.86	15.66	15.48
18.3000	15.32	15.19	15.07	14.97	14.87
18.5500	14.78	14.70	14.62	14.55	14.47
18.8000	14.40	14.33	14.26	14.19	14.12
19.0500	14.05	13.98	13.91	13.84	13.77
19.3000	13.71	13.64	13.57	13.50	13.43
19.5500	13.36	13.29	13.22	13.15	13.09
19.8000	13.02	12.95	12.88	12.81	12.74
20.0500	12.67	12.60	12.54	12.47	12.41
20.3000	12.35	12.29	12.24	12.18	12.12
20.5500	12.07	12.01	11.96	11.91	11.85
20.8000	11.80	11.74	11.69	11.64	11.59
21.0500	11.54	11.49	11.44	11.39	11.34
21.3000	11.29	11.23	11.18	11.13	11.08
21.5500	11.02	10.97	10.91	10.86	10.81
21.8000	10.76	10.71	10.66	10.61	10.56
22.0500	10.51	10.45	10.40	10.35	10.29
22.3000	10.24	10.18	10.13	10.07	10.02
22.5500	9.97	9.92	9.87	9.82	9.77
22.8000	9.72	9.67	9.61	9.56	9.51
23.0500	9.45	9.40	9.34	9.29	9.23
23.3000	9.18	9.13	9.08	9.03	8.98
23.5500	8.93	8.88	8.82	8.77	8.71
23.8000	8.66	8.61	8.55	8.50	8.42
24.0500	8.25	7.87	7.17	6.15	5.01
24.3000	3.91	2.94	2.17	1.59	1.17
24.5500	.87	.64	.47	.34	.25
24.8000	.18	.13	.09	.07	.05
25.0500	.03	.02	.01	.01	.00
25.3000	.00				

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
 Duration = 24.0000 hrs Rain Depth = 8.0000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST WATERSHED A 100
 Tc = .4043 hrs
 Drainage Area = 193.480 acres Runoff CN= 80

=====
 Computational Time Increment = .05391 hrs
 Computed Peak Time = 12.2906 hrs
 Computed Peak Flow = 770.10 cfs

 Time Increment for HYG File = .0500 hrs
 Peak Time, Interpolated Output = 12.3000 hrs
 Peak Flow, Interpolated Output = 765.03 cfs
 =====

DRAINAGE AREA

 ID: POST WATERSHED A
 CN = 80
 Area = 193.480 acres
 S = 2.5000 in
 0.2S = .5000 in

Cumulative Runoff

 5.6250 in
 90.694 ac-ft

HYG Volume... 90.700 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .40430 hrs (ID: POST WATERSHED A)
 Computational Incr, Tm = .05391 hrs = 0.20000 Tp

 Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
 K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
 Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

 Unit peak, qp = 542.23 cfs
 Unit peak time Tp = .26953 hrs
 Unit receding limb, Tr = 1.07812 hrs
 Total unit time, Tb = 1.34765 hrs

Type.... Unit Hyd. (HYG output) Page 6.15
 Name.... POST WATERSHED A Tag: 100 Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
 Duration = 24.0000 hrs Rain Depth = 8.0000 in
 Rain Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Rain File -ID = - TypeIII 24hr
 Unit Hyd Type = Default Curvilinear
 HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 HYG File - ID = work_pad.hyg - POST WATERSHED A 100
 Tc = .4043 hrs
 Drainage Area = 193.480 acres Runoff CN= 80
 Calc.Increment= .05391 hrs Out.Incr.= .0500 hrs
 HYG Volume = 90.700 ac-ft

HYDROGRAPH ORDINATES (cfs)

Output Time increment = .0500 hrs

Time on left represents time for first value in each row.

Time hrs	0.00	0.05	0.10	0.15	0.20
5.4000	.00	.00	.01	.02	.05
5.6500	.09	.14	.22	.30	.39
5.9000	.49	.60	.70	.82	.93
6.1500	1.05	1.17	1.30	1.43	1.57
6.4000	1.71	1.86	2.02	2.17	2.34
6.6500	2.50	2.68	2.85	3.03	3.22
6.9000	3.41	3.61	3.81	4.01	4.22
7.1500	4.43	4.65	4.88	5.10	5.34
7.4000	5.57	5.81	6.06	6.31	6.56
7.6500	6.82	7.08	7.35	7.62	7.90
7.9000	8.18	8.46	8.75	9.05	9.35
8.1500	9.66	10.00	10.35	10.73	11.14
8.4000	11.57	12.02	12.49	12.97	13.47
8.6500	13.99	14.52	15.06	15.62	16.18
8.9000	16.76	17.35	17.95	18.57	19.20
9.1500	19.84	20.49	21.15	21.83	22.51
9.4000	23.21	23.91	24.63	25.35	26.09
9.6500	26.83	27.59	28.36	29.13	29.92
9.9000	30.72	31.53	32.35	33.18	34.04
10.1500	34.93	35.88	36.90	38.00	39.18
10.4000	40.42	41.73	43.09	44.49	45.94
10.6500	47.41	48.92	50.45	52.01	53.59
10.9000	55.19	56.82	58.46	60.18	62.01
11.1500	64.10	66.54	69.43	72.79	76.62
11.4000	80.85	85.43	90.44	96.23	103.52
11.6500	113.73	127.99	148.26	174.89	208.08
11.9000	247.98	298.69	364.50	448.84	546.21
12.1500	641.92	718.21	760.89	765.03	735.67
12.4000	685.51	624.02	560.93	499.41	440.78
12.6500	385.82	336.19	293.12	257.17	227.95

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
12.9000	204.40	185.41	169.75	156.60	145.36
13.1500	135.78	127.58	120.57	114.73	109.90
13.4000	105.95	102.66	99.84	97.35	95.10
13.6500	93.03	91.09	89.25	87.47	85.74
13.9000	84.03	82.32	80.62	78.94	77.29
14.1500	75.71	74.21	72.83	71.56	70.41
14.4000	69.34	68.35	67.41	66.51	65.63
14.6500	64.78	63.93	63.10	62.27	61.45
14.9000	60.64	59.83	59.02	58.21	57.41
15.1500	56.60	55.80	54.99	54.18	53.37
15.4000	52.56	51.74	50.93	50.11	49.30
15.6500	48.48	47.67	46.86	46.04	45.23
15.9000	44.42	43.60	42.78	41.97	41.17
16.1500	40.41	39.69	39.02	38.41	37.86
16.4000	37.36	36.89	36.46	36.04	35.65
16.6500	35.26	34.88	34.51	34.14	33.77
16.9000	33.41	33.05	32.69	32.33	31.97
17.1500	31.61	31.26	30.90	30.55	30.19
17.4000	29.83	29.47	29.11	28.75	28.39
17.6500	28.03	27.67	27.32	26.96	26.60
17.9000	26.24	25.89	25.53	25.17	24.82
18.1500	24.48	24.17	23.89	23.65	23.44
18.4000	23.25	23.09	22.94	22.81	22.68
18.6500	22.56	22.44	22.32	22.21	22.10
18.9000	21.99	21.88	21.77	21.66	21.55
19.1500	21.44	21.34	21.23	21.12	21.02
19.4000	20.91	20.80	20.70	20.59	20.48
19.6500	20.37	20.26	20.16	20.05	19.94
19.9000	19.84	19.73	19.62	19.51	19.41
20.1500	19.30	19.20	19.10	19.01	18.92
20.4000	18.83	18.75	18.66	18.57	18.49
20.6500	18.41	18.33	18.24	18.15	18.07
20.9000	17.99	17.91	17.83	17.75	17.68
21.1500	17.60	17.52	17.44	17.36	17.27
21.4000	17.19	17.11	17.03	16.94	16.86
21.6500	16.77	16.69	16.61	16.53	16.46
21.9000	16.38	16.31	16.23	16.14	16.06
22.1500	15.98	15.90	15.82	15.73	15.65
22.4000	15.56	15.48	15.39	15.31	15.23
22.6500	15.16	15.09	15.01	14.93	14.85
22.9000	14.76	14.68	14.60	14.51	14.43
23.1500	14.34	14.26	14.17	14.09	14.01
23.4000	13.93	13.86	13.78	13.71	13.63
23.6500	13.54	13.46	13.37	13.29	13.21
23.9000	13.13	13.04	12.92	12.65	12.08

Type.... Unit Hyd. (HYG output) Page 6.17
 Name.... POST WATERSHED A Tag: 100 Event: 100 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 100

HYDROGRAPH ORDINATES (cfs)

Output Time increment = .0500 hrs

Time on left represents time for first value in each row.

Time hrs					
24.1500	11.00	9.43	7.69	6.01	4.51
24.4000	3.32	2.44	1.80	1.33	.97
24.6500	.71	.52	.38	.28	.20
24.9000	.14	.10	.07	.05	.03
25.1500	.02	.01	.00	.00	

Name.... SITE BASIN

File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW

LEVEL POOL ROUTING DATA

HYG Dir = T:\Land Projects R2\020042TRI\PondPack files\
 Inflow HYG file = work_pad.hyg - SITE BASIN IN 1
 Outflow HYG file = work_pad.hyg - SITE BASIN OUT 1

Pond Node Data = SITE BASIN
 Pond Volume Data = SITE BASIN
 Pond Outlet Data = Outlet 1

No Infiltration

INITIAL CONDITIONS

 Starting WS Elev = 100.00 ft
 Starting Volume = .000 ac-ft
 Starting Outflow = .00 cfs
 Starting Infiltr. = .00 cfs
 Starting Total Qout = .00 cfs
 Time Increment = .0500 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infiltr. cfs	Q Total cfs	2S/t + O cfs
100.00	.00	.000	.0500	.00	.00	.00
100.50	1.14	.027	.0589	.00	1.14	14.31
101.00	4.38	.059	.0685	.00	4.38	32.95
101.50	9.44	.096	.0789	.00	9.44	55.84
102.00	15.97	.138	.0900	.00	15.97	82.79
102.50	23.63	.184	.0948	.00	23.63	112.80
103.00	32.04	.233	.0997	.00	32.04	144.76
103.50	40.82	.284	.1048	.00	40.82	178.29
104.00	49.62	.338	.1100	.00	49.62	213.08
104.50	56.17	.394	.1148	.00	56.17	246.83
105.00	61.49	.453	.1198	.00	61.49	280.54
105.50	66.40	.514	.1248	.00	66.40	315.05
106.00	70.98	.577	.1300	.00	70.98	350.46
106.50	98.70	.644	.1349	.00	98.70	410.23
107.00	145.26	.712	.1398	.00	145.26	490.02
107.50	203.70	.783	.1449	.00	203.70	582.91
108.00	271.49	.857	.1500	.00	271.49	686.37

Type.... Node: Pond Inflow Summary
 Name.... SITE BASIN IN
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

Page 7.02
 Event: 1 yr

SUMMARY FOR HYDROGRAPH ADDITION
 at Node: SITE BASIN IN

HYG Directory: T:\Land Projects R2\020042TRI\PondPack files\

```

=====
Upstream Link ID  Upstream Node ID  HYG file      HYG ID        HYG tag
-----
SITE DETAINED    POST SITE (DET.)  work_pad.hyg  POST SITE (DET.)1
=====
  
```

INFLOWS TO: SITE BASIN IN

```

-----
HYG file      HYG ID        HYG tag      Volume      Peak Time     Peak Flow
ac-ft         hrs           cfs
-----
work_pad.hyg  POST SITE (DET.)  1            2.218       12.2000       21.88
  
```

TOTAL FLOW INTO: SITE BASIN IN

```

-----
HYG file      HYG ID        HYG tag      Volume      Peak Time     Peak Flow
ac-ft         hrs           cfs
-----
work_pad.hyg  SITE BASIN IN  1            2.218       12.2000       21.88
  
```

Type.... Node: Pond Inflow Summary
 Name.... SITE BASIN IN
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

Page 7.03
 Event: 1 yr

TOTAL NODE INFLOW...

HYG file = T:\Land Projects R2\020042TRI\PondPack files\work_pad.hyg
 HYG ID = SITE BASIN IN
 HYG Tag = 1

 Peak Discharge = 21.88 cfs
 Time to Peak = 12.2000 hrs
 HYG Volume = 2.218 ac-ft

HYDROGRAPH ORDINATES (cfs)

Output Time increment = .0500 hrs
 Time on left represents time for first value in each row.

Time hrs					
8.9500	.00	.00	.01	.01	.02
9.2000	.03	.04	.05	.06	.07
9.4500	.09	.10	.11	.13	.14
9.7000	.16	.18	.19	.21	.23
9.9500	.24	.26	.28	.30	.32
10.2000	.34	.36	.39	.41	.44
10.4500	.47	.50	.53	.56	.59
10.7000	.63	.66	.70	.74	.77
10.9500	.81	.85	.90	.94	1.00
11.2000	1.07	1.14	1.23	1.33	1.44
11.4500	1.55	1.67	1.82	2.04	2.37
11.7000	2.87	3.55	4.40	5.43	6.59
11.9500	8.23	10.71	14.11	17.75	20.71
12.2000	21.88	21.17	19.47	17.39	15.46
12.4500	13.67	11.97	10.33	8.83	7.53
12.7000	6.47	5.69	5.11	4.67	4.34
12.9500	4.06	3.82	3.61	3.42	3.27
13.2000	3.14	3.03	2.95	2.88	2.83
13.4500	2.77	2.72	2.68	2.63	2.58
13.7000	2.54	2.49	2.44	2.40	2.35
13.9500	2.31	2.26	2.21	2.17	2.13
14.2000	2.09	2.06	2.03	2.01	1.98
14.4500	1.96	1.93	1.91	1.89	1.87
14.7000	1.84	1.82	1.80	1.78	1.75
14.9500	1.73	1.71	1.68	1.66	1.64
15.2000	1.61	1.59	1.57	1.54	1.52
15.4500	1.50	1.47	1.45	1.43	1.40
15.7000	1.38	1.36	1.33	1.31	1.28
15.9500	1.26	1.24	1.21	1.19	1.17
16.2000	1.15	1.13	1.12	1.11	1.10
16.4500	1.08	1.07	1.06	1.05	1.04

Type.... Node: Pond Inflow Summary
 Name.... SITE BASIN IN
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 1

Page 7.04
 Event: 1 yr

HYDROGRAPH ORDINATES (cfs)

Output Time increment = .0500 hrs

Time on left represents time for first value in each row.

Time hrs					
16.7000	1.03	1.02	1.01	1.00	.99
16.9500	.98	.97	.96	.95	.94
17.2000	.93	.91	.90	.89	.88
17.4500	.87	.86	.85	.84	.83
17.7000	.82	.81	.80	.79	.78
17.9500	.77	.75	.74	.73	.72
18.2000	.72	.71	.71	.70	.70
18.4500	.69	.69	.69	.68	.68
18.7000	.68	.67	.67	.67	.66
18.9500	.66	.66	.66	.65	.65
19.2000	.65	.64	.64	.64	.63
19.4500	.63	.63	.62	.62	.62
19.7000	.61	.61	.61	.60	.60
19.9500	.60	.59	.59	.59	.59
20.2000	.58	.58	.58	.58	.57
20.4500	.57	.57	.57	.56	.56
20.7000	.56	.56	.55	.55	.55
20.9500	.55	.54	.54	.54	.54
21.2000	.53	.53	.53	.53	.52
21.4500	.52	.52	.52	.51	.51
21.7000	.51	.51	.50	.50	.50
21.9500	.50	.50	.49	.49	.49
22.2000	.49	.48	.48	.48	.47
22.4500	.47	.47	.47	.47	.46
22.7000	.46	.46	.46	.45	.45
22.9500	.45	.45	.44	.44	.44
23.2000	.44	.43	.43	.43	.43
23.4500	.42	.42	.42	.42	.41
23.7000	.41	.41	.41	.40	.40
23.9500	.40	.39	.38	.34	.27
24.2000	.19	.12	.08	.05	.03
24.4500	.02	.01	.01	.00	.00
24.7000	.00	.00			

Type.... Node: Pond Inflow Summary Page 7.05
 Name.... SITE BASIN IN Event: 10 yr
 File.... T:\Land Projects R2\020042TRI\PondPack files\POST-DEV EXM.PPW
 Storm... TypeIII 24hr Tag: 10

SUMMARY FOR HYDROGRAPH ADDITION
 at Node: SITE BASIN IN

HYG Directory: T:\Land Projects R2\020042TRI\PondPack files\

```

=====
Upstream Link ID  Upstream Node ID  HYG file      HYG ID        HYG tag
-----
SITE DETAINED    POST SITE (DET.)  work_pad.hyg  POST SITE (DET.)  10
=====
  
```

```

INFLOWS TO:  SITE BASIN  IN
-----
HYG file      HYG ID          HYG tag        Volume      Peak Time     Peak Flow
ac-ft         hrs             cfs
-----
work_pad.hyg  POST SITE (DET.)  10             5.893       12.2000      58.05
  
```

```

TOTAL FLOW INTO:  SITE BASIN  IN
-----
HYG file      HYG ID          HYG tag        Volume      Peak Time     Peak Flow
ac-ft         hrs             cfs
-----
work_pad.hyg  SITE BASIN      IN  10             5.893       12.2000      58.05
  
```

TOTAL NODE INFLOW...
 HYG file = T:\Land Projects R2\020042TRI\PondPack files\work_pad.hyg
 HYG ID = SITE BASIN IN
 HYG Tag = 10

 Peak Discharge = 58.05 cfs
 Time to Peak = 12.2000 hrs
 HYG Volume = 5.893 ac-ft

HYDROGRAPH ORDINATES (cfs)
 Output Time increment = .0500 hrs

Time hrs	Time on left represents time for first value in each row.				
6.2500	.00	.00	.01	.01	.02
6.5000	.03	.03	.04	.05	.06
6.7500	.07	.08	.09	.11	.12
7.0000	.13	.14	.15	.17	.18
7.2500	.19	.21	.22	.24	.25
7.5000	.27	.28	.30	.31	.33
7.7500	.35	.36	.38	.40	.41
8.0000	.43	.45	.47	.49	.51
8.2500	.54	.56	.59	.62	.65
8.5000	.68	.71	.74	.77	.80
8.7500	.84	.87	.91	.95	.98
9.0000	1.02	1.06	1.10	1.14	1.19
9.2500	1.23	1.27	1.32	1.36	1.41
9.5000	1.45	1.50	1.55	1.60	1.65
9.7500	1.70	1.75	1.80	1.85	1.90
10.0000	1.96	2.01	2.07	2.14	2.20
10.2500	2.28	2.36	2.44	2.53	2.62
10.5000	2.72	2.81	2.91	3.01	3.11
10.7500	3.21	3.31	3.42	3.53	3.64
11.0000	3.75	3.87	4.00	4.17	4.37
11.2500	4.62	4.89	5.20	5.52	5.86
11.5000	6.21	6.66	7.33	8.37	9.93
11.7500	12.01	14.54	17.49	20.74	25.14
12.0000	31.65	40.39	49.33	56.09	58.05
12.2500	55.18	49.98	44.06	38.69	33.85
12.5000	29.39	25.17	21.38	18.13	15.51
12.7500	13.58	12.14	11.06	10.23	9.54
13.0000	8.96	8.46	8.01	7.62	7.31
13.2500	7.06	6.86	6.70	6.55	6.42
13.5000	6.30	6.19	6.07	5.96	5.85
13.7500	5.73	5.62	5.51	5.40	5.29

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
14.0000	5.18	5.07	4.97	4.87	4.78
14.2500	4.70	4.64	4.57	4.51	4.46
14.5000	4.40	4.35	4.29	4.24	4.19
14.7500	4.13	4.08	4.02	3.97	3.92
15.0000	3.86	3.81	3.75	3.70	3.65
15.2500	3.59	3.54	3.48	3.43	3.37
15.5000	3.32	3.26	3.21	3.15	3.10
15.7500	3.05	2.99	2.94	2.88	2.83
16.0000	2.77	2.72	2.67	2.62	2.58
16.2500	2.54	2.51	2.48	2.45	2.42
16.5000	2.40	2.37	2.35	2.32	2.30
16.7500	2.28	2.25	2.23	2.20	2.18
17.0000	2.16	2.13	2.11	2.08	2.06
17.2500	2.04	2.01	1.99	1.96	1.94
17.5000	1.92	1.89	1.87	1.84	1.82
17.7500	1.80	1.77	1.75	1.72	1.70
18.0000	1.67	1.65	1.63	1.61	1.59
18.2500	1.58	1.56	1.55	1.55	1.54
18.5000	1.53	1.52	1.51	1.51	1.50
18.7500	1.49	1.49	1.48	1.47	1.46
19.0000	1.46	1.45	1.44	1.44	1.43
19.2500	1.42	1.41	1.41	1.40	1.39
19.5000	1.38	1.38	1.37	1.36	1.36
19.7500	1.35	1.34	1.33	1.33	1.32
20.0000	1.31	1.30	1.30	1.29	1.28
20.2500	1.28	1.27	1.27	1.26	1.26
20.5000	1.25	1.24	1.24	1.23	1.23
20.7500	1.22	1.22	1.21	1.21	1.20
21.0000	1.20	1.19	1.19	1.18	1.17
21.2500	1.17	1.16	1.16	1.15	1.15
21.5000	1.14	1.13	1.13	1.12	1.12
21.7500	1.11	1.11	1.10	1.10	1.09
22.0000	1.09	1.08	1.08	1.07	1.07
22.2500	1.06	1.05	1.05	1.04	1.04
22.5000	1.03	1.03	1.02	1.02	1.01
22.7500	1.01	1.00	.99	.99	.98
23.0000	.98	.97	.97	.96	.95
23.2500	.95	.94	.94	.93	.93
23.5000	.92	.92	.91	.91	.90
23.7500	.89	.89	.88	.88	.87
24.0000	.86	.83	.74	.58	.41
24.2500	.27	.17	.11	.07	.04
24.5000	.03	.02	.01	.01	.00
24.7500	.00	.00			

APPENDIX D

WATER QUALITY COMPUTATIONS

Water quality Calculations + Designs

Area A-1

$WQ_v = 0.14 \text{ ac-ft}$

Design shall utilize Dry swale into level spreader

$280 \text{ L.F.} \times 6' \text{ w} \times 1.5' \text{ d} = 2520 \text{ cu-ft}$
 $\approx 0.077 \text{ ac-ft}$

Bioretention Area

$A_s = (WQ_v)(d_s) / \sum (k)(h_f + d_s)(t_s)$

$WQ_v = 0.14$
 $d_s = 3.42$
 $k = 0.5$
 $h_f = 0.25$
 $d_s = 3.42$
 $t_s = 2$

$A_s = \frac{(6,100)(3.42)}{(0.5)(3.67)(2)} = \frac{20,862}{3.67} =$

$A_s = 0.13 \text{ ac-ft}$
 $\approx 5.682 \text{ sq-ft}$

Area A-2

$WQ_v = 0.14 \text{ ac-ft}$
 $\approx 6,200 \text{ cu-ft}$

Design shall utilize Pocket Wet Basin w/ forebay.

Forebay Size = 680 cu-ft (11%)
 Extended Detention + Percolant Pool $\approx 0.18 \text{ ac-ft}$
 See Attached Area + Volume calculation
 Detention From elevation 540-544'

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Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
540.00	-----	.0200	.0000	.000	.000
542.00	-----	.0500	.1016	.068	.068
544.00	-----	.0700	.1792	.119	.187

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Areal} + \text{Area2} + \text{sq.rt.}(\text{Areal}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
Areal, Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Basin A-2

Area A-3

$$WQ_u = 0.126 \text{ ac-ft}$$

Bioretention design

$$\text{Sedimentation Basin} \approx 600 \text{ cu-ft}$$

$$A_s = \frac{(WQ_u)(d_s)}{[k](h_s + d_s)(T_s)} = \frac{(5,500)(3.42)}{(.5)(3.67)(2)} = \frac{18,810}{3.67}$$

$$A_s = 0.117 \text{ ac-ft} \\ \approx 5,125 \text{ sq. ft}$$

Area A-4

$$WQ_u = 0.14 \text{ ac-ft}$$

Bioretention design

$$\text{Sedimentation Basin} = 610 \text{ cu-ft}$$

$$A_s = \frac{(WQ_u)(d_s)}{[k](h_s + d_s)(T_s)} = \frac{(6,100)(3.42)}{(.5)(3.67)(2)} = \frac{20,862}{3.67}$$

$$A_s = 5,684 \text{ sq-ft}$$

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JOB Golden Triangle @ Covered Bridge
SHEET NO. 3 OF 3
CALCULATED BY JG DATE 12/20/04
CHECKED BY _____ DATE _____
SCALE _____

Area B-1

$$WQ_v = 0.10 \text{ ac-ft}$$

Dry swale Design

$$270' L \times 8' w \times 1.5' D = 3240 \text{ cu-ft} \\ = 0.07 \text{ ac-ft}$$

$$140' L \times 6' w \times 1.5' D = 1260 \text{ cu-ft} \\ \approx 0.03 \text{ ac-ft}$$

$$\text{Total provided capacity} = 0.10 \text{ ac-ft}$$

Area B-2

$$WQ_v = 0.06$$

Retention Design

$$A_f = \frac{(WQ_v)(d_f)}{K + (h_f + d_f)(T_f)} = \frac{2613 \times 3.42}{0.5(3.67)(2)} = \frac{8936}{3.67}$$

$$A_f = 2,434 \text{ sq-ft}$$

$$\text{Sedimentation Basin} = 400 \text{ cu-ft}$$

- All Sedimentation Basins shall utilize Standpipe outlet with Emergency spillway.

APPENDIX E

**EXCERPTS FROM NEW YORK STATE STORMWATER DESIGN
MANUAL**

Section 4.8 Downstream Analysis

Overbank, and extreme flood requirements may be waived based on the results of a downstream analysis. In addition, such an analysis for overbank and extreme flood control is recommended for larger sites (i.e., greater than 50 acres) to size facilities in the context of a larger watershed. The analysis will help ensure that storage provided at a site is appropriate when combined with upstream and downstream flows. For example, detention at a site may in some instances exacerbate flooding problems within a watershed. This section provides brief guidance for conducting this analysis, including the specific points along the downstream channel to be evaluated and minimum elements to be included in the analysis.

Downstream analysis can be conducted using the 10% rule. That is, the analysis should extend from the point of discharge downstream to the point on the stream where the site represents 10% of the total drainage area. For example, the analysis points for a 10-acre would include points on the stream from the points of discharge to the nearest downstream point with a drainage area of 100 acres. The required elements of the downstream analysis are described below.

- Compute pre-development and post-development peak flows and velocities for design storms (e.g., 10-year and 100-year), at all downstream confluences with first order or higher streams up to and including the point where the 10% rule is met. These analyses should include scenarios both with and without stormwater treatment practices in place, where applicable.
- Evaluate hydrologic and hydraulic effects of all culverts and/or obstructions within the downstream channel.
- Assess water surface elevations to determine if an increase in water surface elevations will impact existing buildings and other structures.

The design, or exemption, at a site level can be approved if both of the following criteria are met:

- Peak flow rates increase by less than 5% of the pre-developed condition for the design storm (e.g., 10-year or 100-year)
- No downstream structures or buildings are impacted.

Section 4.9 Stormwater Hotspots

A stormwater hotspot is defined as a land use or activity that generates higher concentrations of hydrocarbons, trace metals or toxicants than are found in typical stormwater runoff, based on monitoring studies. If a site is designated as a hotspot, it has important implications for how stormwater is managed. First and foremost, stormwater runoff from hotspots cannot be allowed to infiltrate into groundwater, where it may contaminate water supplies. Second, a greater level of stormwater treatment is needed at hotspot sites to prevent pollutant washoff after construction. This treatment plan typically involves preparing and implementing a *stormwater pollution prevention plan* that involves a series of operational practices at the site that reduce the generation of pollutants from a site or prevent contact of rainfall with the pollutants. Table 4.3 provides a list of designated hotspots for the State of New York

Under EPA's stormwater NPDES program, some industrial sites are required to prepare and implement a stormwater pollution prevention plan. A list of industrial categories that are subject to the pollution prevention requirement can be found in the State of New York SPDES. In addition, New York's requirements for preparing and implementing a stormwater pollution prevention plan are described in the SPDES general discharge permit. The stormwater pollution prevention plan requirement applies to both existing and new industrial sites.

Table 4.3 Classification of Stormwater Hotspots

The following land uses and activities are deemed *stormwater hotspots*:

- Vehicle salvage yards and recycling facilities #
- Vehicle fueling stations
- Vehicle service and maintenance facilities
- Vehicle and equipment cleaning facilities #
- Fleet storage areas (bus, truck, etc.) #
- Industrial sites (based on SIC codes outlined in the SPDES)
- Marinas (service and maintenance) #
- Outdoor liquid container storage
- Outdoor loading/unloading facilities
- Public works storage areas
- Facilities that generate or store hazardous materials #
- Commercial container nursery
- Other land uses and activities as designated by an appropriate review authority

indicates that the land use or activity is required to prepare a stormwater pollution prevention plan under the SPDES stormwater program.

The following land uses and activities are not normally considered hotspots:

- Residential streets and rural highways
- Residential development
- Institutional development
- Office developments
- Non-industrial rooftops
- Pervious areas, except golf courses and nurseries (which may need an Integrated Pest Management (IPM) Plan).

While large highways (average daily traffic volume (ADT) greater than 30,000) are not designated as a stormwater hotspot, it is important to ensure that highway stormwater management plans adequately protect groundwater.

Table 5.1 Stormwater Management Practices Acceptable for Water Quality

Group	Practice	Description
Pond	Micropool Extended Detention Pond (P-1)	Pond that treats the majority of the water quality volume through extended detention, and incorporates a micropool at the outlet of the pond to prevent sediment resuspension.
	Wet Pond (P-2)	Pond that provides storage for the entire water quality volume in the permanent pool.
	Wet Extended Detention Pond (P-3)	Pond that treats a portion of the water quality volume by detaining storm flows above a permanent pool for a specified minimum detention time.
	Multiple Pond System (P-4)	A group of ponds that collectively treat the water quality volume..
	Pocket Pond (P-5)	A stormwater wetland design adapted for the treatment of runoff from small drainage areas that has little or no baseflow available to maintain water elevations and relies on ground water to maintain a permanent pool.
Wetland	Shallow Wetland (W-1)	A wetland that provides water quality treatment entirely in a wet shallow marsh.
	Extended Detention Wetland (W-2)	A wetland system that provides some fraction of the water quality volume by detaining storm flows above the marsh surface.
	Pond/ Wetland System (W-3)	A wetland system that provides a portion of the water quality volume in the permanent pool of a wet pond that precedes the marsh for a specified minimum detention time.
	Pocket Wetland (W-4)	A shallow wetland design adapted for the treatment of runoff from small drainage areas that has variable water levels and relies on groundwater for its permanent pool.
Infiltration	Infiltration Trench (I-1)	An infiltration practice that stores the water quality volume in the void spaces of a gravel trench before it is infiltrated into the ground.
	Infiltration Basin (I-2)	An infiltration practice that stores the water quality volume in a shallow depression, before it is infiltrated it into the ground.
	Dry Well (I-3)	An infiltration practice similar in design to the infiltration trench, and best suited for treatment of rooftop runoff.
Filtering Practices	Surface Sand Filter (F-1)	A filtering practice that treats stormwater by settling out larger particles in a sediment chamber, and then filtering stormwater through a sand matrix.
	Underground Sand Filter (F-2)	A filtering practice that treats stormwater as it flows through underground settling and filtering chambers.
	Perimeter Sand Filter (F-3)	A filter that incorporates a sediment chamber and filter bed as parallel vaults adjacent to a parking lot.
	Organic Filter (F-4)	A filtering practice that uses an organic medium such as compost in the filter, in the place of sand.
	Bioretention (F-5)	A shallow depression that treats stormwater as it flows through a soil matrix, and is returned to the storm drain system.
Open Channels	Dry Swale (O-1)	An open drainage channel or depression explicitly designed to detain and promote the filtration of stormwater runoff into the soil media.
	Wet Swale (O-2)	An open drainage channel or depression designed to retain water or intercept groundwater for water quality treatment.

Table 7.1 Land Use Selection Matrix

SMP Group	SMP Design	Rural	Residential	Roads and Highways	Commercial/High Density	Hotspots	Ultra Urban
Pond	Micropool ED	○	○	○	◐	①	●
	Wet Pond	○	○	○	◐	①	●
	Wet ED Pond	○	○	○	◐	①	●
	Multiple Pond	○	○	◐	◐	①	●
	Pocket Pond	○	◐	○	◐	●	●
Wetland	Shallow Wetland	○	○	◐	◐	①	●
	ED Wetland	○	○	◐	◐	①	●
	Pond/Wetland	○	○	●	◐	①	●
	Pocket Wetland	○	◐	○	◐	●	●
Infiltration	Infiltration Trench	◐	◐	○	○	●	◐
	Shallow I-Basin	◐	◐	◐	◐	●	◐
	Dry Well ¹	◐	○	●	◐	●	◐
Filters	Surface Sand Filter	●	◐	○	○	②	○
	Underground SF	●	●	◐	○	○	○
	Perimeter SF	●	●	◐	○	○	○
	Organic SF	●	◐	○	○	②	○
	Bioretention	◐	◐	○	○	②	○
Open Channels	Dry Swale	○	◐	○	◐	②	◐
	Wet Swale	○	●	○	●	●	●

○: Yes. Good option in most cases.
 ◐: Depends. Suitable under certain conditions, or may be used to treat a portion of the site.
 ●: No. Seldom or never suitable.
 ①: Acceptable option, but may require a pond liner to reduce risk of groundwater contamination.
 ②: Acceptable option, if not designed as an exfilter.
 1: The dry well can only be used to treat rooftop runoff

Table 7.2 Physical Feasibility Matrix						
SMP Group	SMP Design	Soils	Water Table	Drainage Area (acres)	Site Slope	Head (ft)
Pond	Micropool ED	HSG A soils may require pond liner.	2 foot separation if hotspot or aquifer	10 min ¹	No more than 15%	6 to 8 ft
	Wet Pond			25 min ¹		
	Wet ED Pond					
	Multiple Pond					
	Pocket Pond	OK	below WT	5 max ²		4 ft
Wetland	Shallow Wetland	HSG A soils may require liner	2 foot separation if hotspot or aquifer	25 min	No more than 8%	3 to 5 ft
	ED Wetland					
	Pond/Wetland					
	Pocket Wetland	OK	below WT	5 max		2 to 3 ft
Infiltration	Infiltration Trench	f _c > 0.5 inch/hr; additional pretreatment required over 2.0 in/hr (See Section 6.3.3)	3 feet, 4 feet if sole source aquifer.	5 max	No more than 15%	1 ft ⁶
	Shallow I-Basin			10 max ³		3 ft
	Dry Well			1 max ⁴		1 ft
Filters	Surface SF	OK	2 feet ⁵	10 max ²	No more than 6%	5 ft
	Underground SF			2 max ²		5 to 7ft
	Perimeter SF			2 max ²		2 to 3 ft
	Organic SF			5 max ²		2 to 4 ft
	Bioretention			5 max ²		5 ft
Open Channels	Dry Swale	Made Soil	2 feet	5 max	No more than 4%	3-5 ft
	Wet Swale	OK	below WT	5 max		1 ft

Notes:

- 1: Unless adequate water balance and anti-clogging device installed
- 2: Drainage area can be larger in some instances
- 3: May be larger in areas where the soil percolation rate is greater than 5.0 in/hr
- 4: Designed to treat rooftop runoff only
- 5: If designed with a permeable bottom, must meet the depth requirements for infiltration practices.
- 6: Required ponding depth above geotextile layer.

Table 7.3b Watershed/Regional Selection Matrix-2			
SMP Group	Reservoir	Estuary/Coastal	Cold Climates
Ponds	<p>Encourage the use of a large permanent pool to improve sediment and phosphorous removal.</p> <p>Promote long detention times to encourage bacteria removal.</p>	<p>Encourage long detention times to promote bacteria removal.</p> <p>Provides high nitrogen removal.</p> <p>In flat coastal areas, a pond drain may not be feasible.</p>	<p>Incorporate design features to improve winter performance.</p>
Wetlands			<p>Encourage the use of salt-tolerant vegetation.</p>
Infiltration	<p>Provide a separation distance from bedrock and water table</p> <p>Pretreat runoff prior to infiltration practices.</p>	<p>OK, but provide a separation distance to seasonally high groundwater.</p> <p>In the sandy soils typical of coastal areas, additional pretreatment may be required (See Section 6.3.3)</p>	<p>Incorporate features to minimize the risk of frost heave.</p> <p>Discourage infiltration of chlorides.</p>
Filtering Systems	<p>Excellent pretreatment for infiltration or open channel practices.</p> <p>Moderate to high coliform removal</p>	<p>Moderate to high coliform removal</p> <p>Designs with a submerged filter bed appear to have very high nitrogen removal</p>	<p>Incorporate design features to improve winter performance.</p>
Open Channels	<p>Poor coliform removal for wet swales.</p>	<p>Poor coliform removal for grass wet swales.</p>	<p>Encourage the use of salt-tolerant vegetation.</p>

Table 7.4 Stormwater Management Capability Matrix

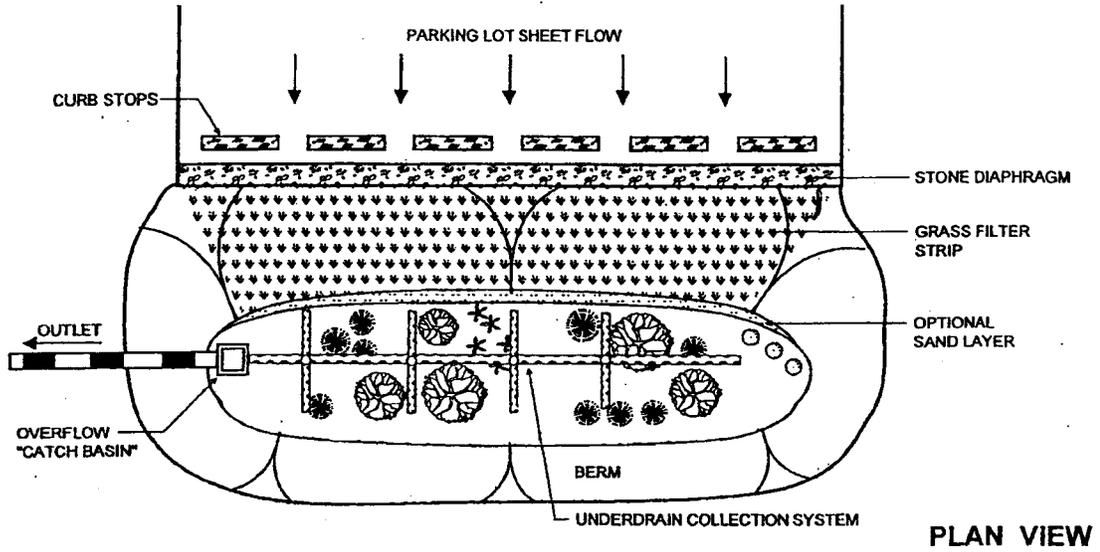
SMP Group	SMP Design	Water Quality			Channel Protection	Flood Control
		Nitrogen	Metals	Bacteria		
Pond	Micropool ED				○	○
	Wet Pond				○	○
	Wet ED Pond	○	○	○	○	○
	Multiple Pond				○	○
	Pocket Pond				○	○
Wetland	Shallow Wetland				○	○
	ED Wetland	○	●	○	○	○
	Pond/Wetland				○	○
	Pocket Wetland				○	①
Infiltration	Infiltration Trench				●	●
	Shallow I-Basin	○	○	○	②	②
	Dry Well				●	●
Filters	Surface Sand Filter				①	●
	Underground SF				●	●
	Perimeter SF	○	○	●	●	●
	Organic SF				●	●
	Bioretention				①	●
Open Channels	Dry Swale	●	○	●	●	●
	Wet Swale				●	●

○: Good option for meeting management goal
 Good pollutant removal (>30% TN, >60% Metals, >70% Bacteria)
 ●: Fair pollutant removal (15-30% TN, 30-60% Metals, 35-70% Bacteria)
 ●: Cannot meet management goal.
 Poor pollutant removal (<15% TN, <30 Metals, <35% Bacteria)
 ①: In most cases, cannot meet this goal, but the design may be adapted to add storage.
 ②: Generally cannot meet this goal, except in areas with soil percolation rates greater than 5.0 in/hr

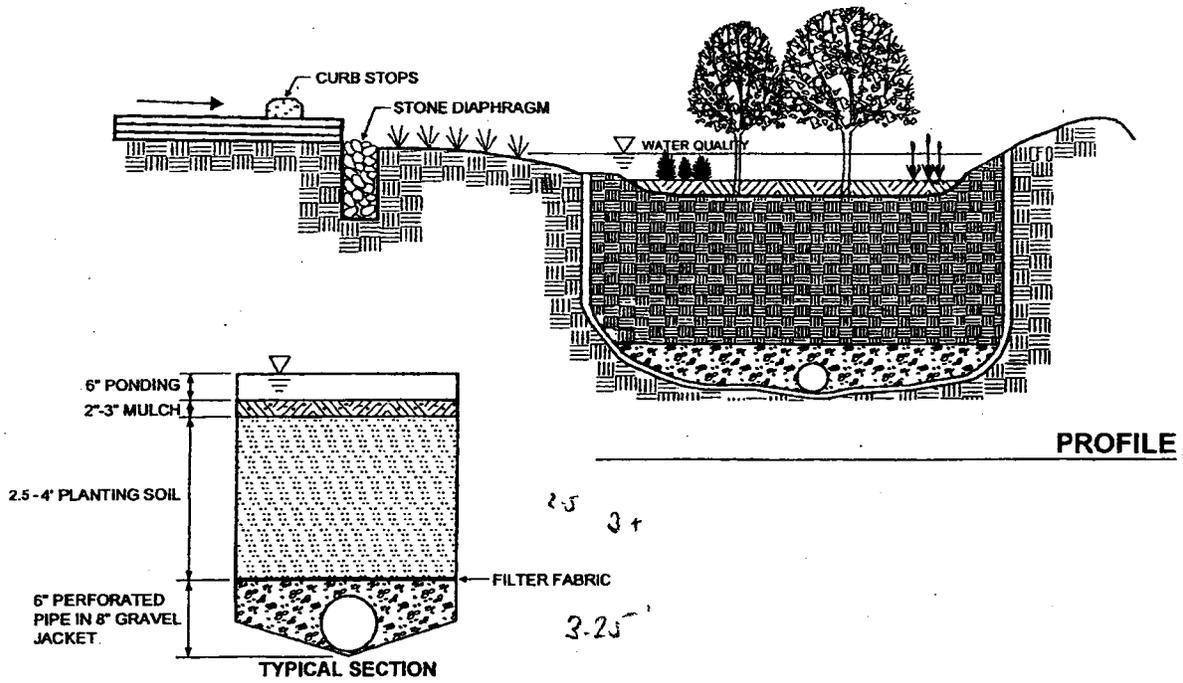
Table 7.5 Community and Environmental Factors Matrix						
SMP Group	SMP List	Ease of Maintenance	Community Acceptance	Affordability	Safety	Habitat
Ponds	Micropool ED	►	►	○	○	►
	Wet Pond	○	○	○	●	○
	Wet ED Pond	○	○	○	●	○
	Multiple Pond	○	○	►	●	○
	Pocket Pond	●	►	○	►	●
Wetlands	Shallow Wetland	►	○	►	○	○
	ED Wetland	►	►	►	►	○
	Pond/Wetland	○	○	►	●	○
	Pocket Wetland	●	●	○	○	►
Infiltration	Infiltration Trench	●	○	►	○	●
	Shallow I-Racin	●	●	►	○	●
	Dry Well	●	►	►	○	●
Filters	Surface SF	►	►	●	○	●
	Underground SF	●	○	●	►	●
	Perimeter SF	●	○	●	○	●
	Organic SF	►	○	●	○	●
	Bioretention	►	►	►	○	►
Open Channels	Dry Swale	○	○	►	○	●
	Wet Swale	○	►	○	○	►

Note: ● Low, ○ High, ► Moderate

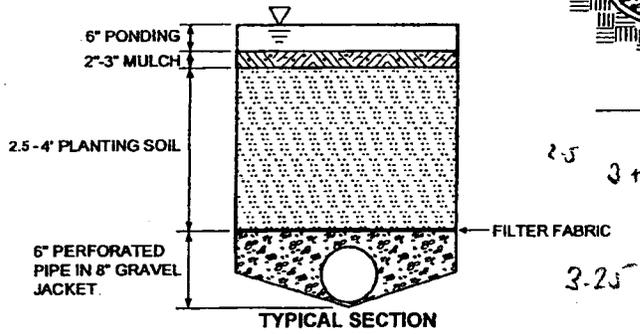
Figure 6.19 Bioretention (F-5)



PLAN VIEW



PROFILE



TYPICAL SECTION

Specifications for Bioretention

Material Specifications

The allowable materials to be used in bioretention area are detailed in Table G.2.

Planting Soil

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of noxious weeds.

The planting soil shall be tested and shall meet the following criteria:

pH range	5.2 - 7.0
organic matter	1.5 - 4%
magnesium	35 lb./ac
phosphorus P ₂ O ₅	75 lb./ac
potassium K ₂ O	85 lb./ac
soluble salts	not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, phosphorus, and potassium and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

Compaction

It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use excavation hoes to remove original soil. If bioretention areas are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and storage volumes and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before back filling the required sand layer. Pump any ponded water before preparing (rototilling) base.

When back filling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When back filling the bioretention facility, place soil in lifts 12" or greater. Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials by hand or with light equipment such as a compact loader or a dozer/loader with marsh tracks.

Plant Installation

Mulch around individual plants only. Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

The plant root ball should be planted so 1/8th of the ball is above final grade surface.

Root stock of the plant material shall be kept moist during transport and on-site storage. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" X 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed shall be tilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch is used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

Underdrains

Under drains to be placed on a 3'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of under drain pipes not terminating in an observation well shall be capped.

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

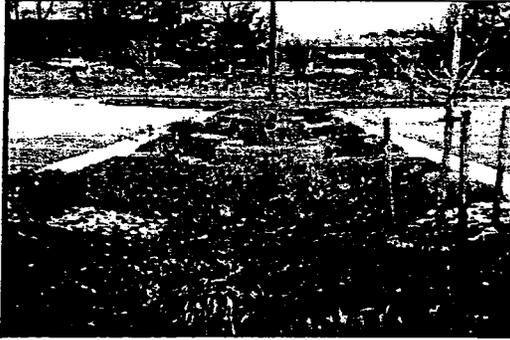
Miscellaneous

The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

Table C.2 Materials Specifications for Bioretention

Parameter	Specification	Size	Notes
Plantings	see your local NRCS Standards and Specifications guidance.	n/a	plantings are site-specific
Planting Soil [4= deep]	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
Mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM D 448 ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
Geotextile	Class "C" apparent opening size (ASTM-D-4751) grab tensile strength (ASTM-D-4632) burst strength (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43, No. 67.	0.25" to 0.75"	
underdrain piping	ASTM D 1785 or AASHTO M-278	6" rigid schedule 40 PVC	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	See local DOT Standards and Specs.; f=c = 3500 psi. @ 28 days, normal weight, air-entrained; re-inforcing to meet ASTM 615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a licensed professional structural engineer.
sand [1= deep]	AASHTO M-6 or ASTM C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

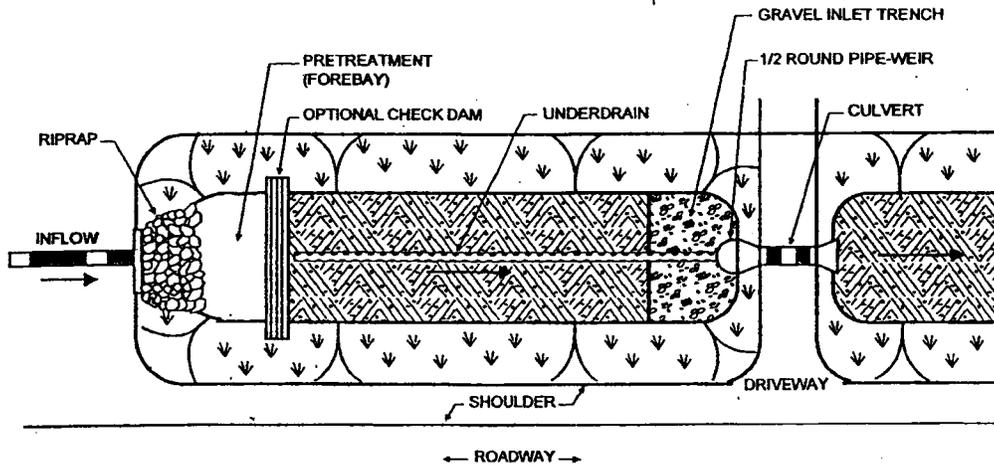
Bioretention Areas (F-5)



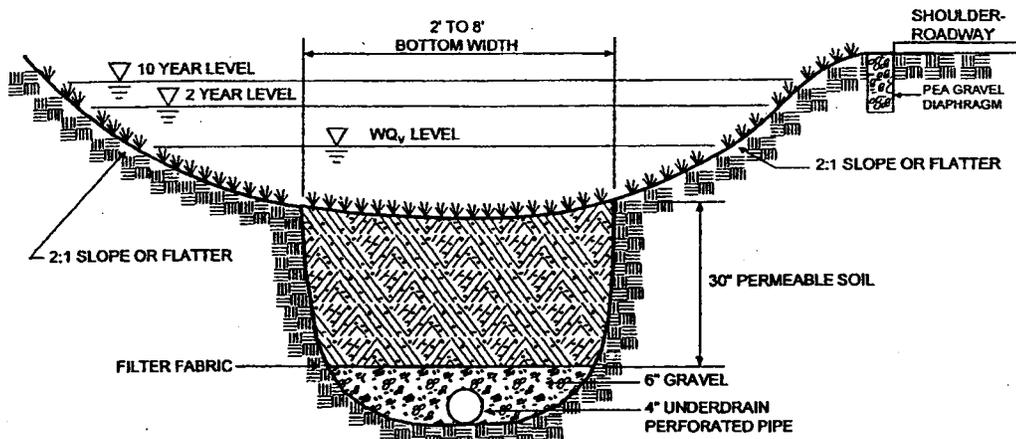
Description: Shallow stormwater basin or landscaped area which utilizes engineered soils and vegetation to capture and treat runoff. The practice is often located in parking lot islands, and can also be used to treat residential areas.

<p style="text-align: center;"><u>KEY CONSIDERATIONS</u></p> <p>CONVEYANCE</p> <ul style="list-style-type: none"> • Provide overflow for the 10-year storm to the conveyance system. • Conveyance to the system is typically overland flow delivered to the surface of the system, typically through curb cuts or over a concrete lip. <p>PRETREATMENT</p> <ul style="list-style-type: none"> • Pretreatment consists of a grass channel or grass filter strip, a gravel diaphragm, and a mulch layer, sized based on the methodologies described in Section 6.4.2. <p>TREATMENT</p> <ul style="list-style-type: none"> • Treatment area should have a four foot deep planting soil bed, a surface mulch layer, and a 6" ponding layer. • Size the treatment area using equations provided in Chapter 6. <p>LANDSCAPING</p> <ul style="list-style-type: none"> • Detailed landscaping plan required. <p>MAINTENANCE</p> <ul style="list-style-type: none"> • Inspect and repair/replace treatment area components • Stone drop (at least 6") provided at the inlet • Remulch annually 	<p style="text-align: center;"><u>STORMWATER MANAGEMENT SUITABILITY</u></p> <p><input checked="" type="checkbox"/> Water Quality</p> <p><input type="checkbox"/> Channel Protection</p> <p><input type="checkbox"/> Overbank Flood Protection</p> <p><input type="checkbox"/> Extreme Flood Protection</p> <p>Accepts Hotspot Runoff: Yes <i>(requires impermeable liner)</i></p>
<p style="text-align: center;"><u>POLLUTANT REMOVAL</u></p> <p><input type="checkbox"/> G Phosphorus</p> <p><input type="checkbox"/> G Nitrogen</p> <p><input type="checkbox"/> G Metals - Cadmium, Copper, Lead, and Zinc removal</p> <p><input type="checkbox"/> F Pathogens - Coliform, Streptococci, E.Coli removal</p> <p style="text-align: center;">Key: G=Good F=Fair P=Poor</p>	<p style="text-align: center;"><u>IMPLEMENTATION CONSIDERATIONS</u></p> <p><input type="checkbox"/> M Capital Cost</p> <p><input type="checkbox"/> M Maintenance Burden</p> <p>Residential</p> <p>Subdivision Use: Yes</p> <p>High Density/Ultra-Urban: Yes</p> <p>Drainage Area: 5 acres max.</p> <p>Soils: Planting soils must meet specified criteria. No restrictions on surrounding soils.</p> <p>Other Considerations:</p> <ul style="list-style-type: none"> • Use of native plants is recommended <p style="text-align: center;">Key: L=Low M=Medium H=High</p>

Figure 6.20 Dry Swale (O-1)



PLAN VIEW



SECTION

Specifications for Open Channels and Filter Strips

Material Specifications

The recommended construction materials for open channels and filter strips are detailed in Table G.3.

Dry Swales

Roto-till soil/gravel interface approximately 6" to avoid a sharp soil/gravel interface.

Permeable soil mixture (20" to 30" deep) should meet the bioretention planting soil specifications.

Check dams, if required, shall be placed as specified.

System to have 6" of freeboard, minimum.

Side slopes to be 3:1 minimum; (4:1 or greater preferred).

No gravel or perforated pipe is to be placed under driveways.

Bottom of facility to be above the seasonably high water table.

Seed with flood/drought resistant grasses; see your local NRCS Standards and Specifications guidance.

Longitudinal slope to be 1 to 2%, maximum [up to 5% with check dams].

Bottom width to be 8' = maximum to avoid braiding; larger widths may be used if proper berming is supplied.
Width to be 2' = minimum.

Wet Swales

Follow above information for dry swales, with the following exceptions: the seasonally high water table may inundate the swale; but not above the design bottom of the channel [NOTE: if the water table is stable within the channel; the WQv storage may start at this point]

Excavate into undisturbed soils; do not use an underdrain system.

Filter Strips

Construct pea gravel diaphragms 12" wide, minimum, and 24" deep minimum.

Pervious berms to be a sand/gravel mix (35-60% sand, 30-55% silt, and 10-25% gravel). Berms to have overflow weirs with 6 inch minimum available head.

Slope range to be 2% minimum to 6% maximum.

Table C.3 Open Vegetated Swale and Filter Strip Materials Specifications

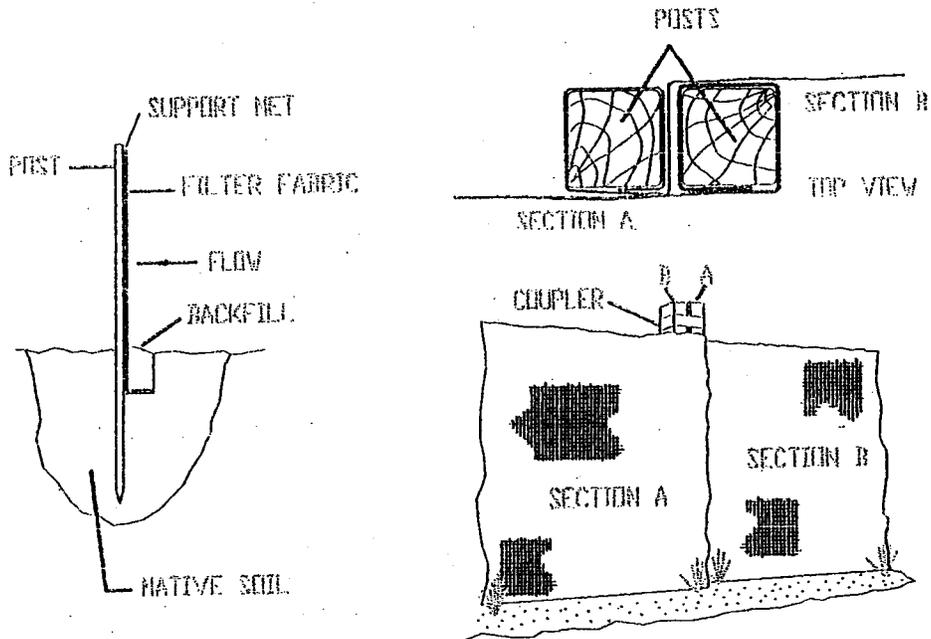
Parameter	Specification	Size	Notes
Dry swale soil	USCS; ML, SM, SC	n/a	soil with a higher percent organic content is preferred
Dry Swale sand	ASTM C-33 fine aggregate concrete sand	0.02" to 0.04"	
Check Dam (pressure treated)	AWPA Standard C6	6" by 6" or 8" by 8"	do not coat with creosote; embed at least 3= into side slopes
Check Dam (natural wood)	Black Locust, Red Mulberry, Cedars, Catalpa, White Oak, Chestnut Oak, Black Walnut	6" to 12" diameter; notch as necessary	do not use the following, as these species have a predisposition towards rot: Ash, Beech, Birch, Elm, Hackberry, hemlock, Hickories, Maples, Red and Black Oak, Pines, Poplar, Spruce, Sweetgum, Willow
Filter Strip sand/gravel pervious berm	sand: per dry swale sand gravel: AASHTO M-43 No. 57	sand: 0.02" to 0.04" gravel: 2" to 1"	mix with approximately 25% loan soil to support grass cover crop; see Bioretention planting soil notes for more detail.
pea gravel diaphragm and curtain drain	ASTM D 448	varies (No. 6) or (1/8" to 3/8")	use clean bank-run gravel
under drain gravel	AASHTO M-43 No. 67	0.25" to 0.75"	
under drain	ASTM D -1785 or AASHTO M-278	6" rigid Schedule 40 PVC	3/8" perf. @ 6" o.c.; 4 holes per row
Geotextile	See local DOT Standards and Specs	n/a	
rip rap	per local DOT criteria	size per New York State DOT requirements based on 10-year design flows	

APPENDIX F

STANDARD EROSION AND SEDIMENT CONTROL PRACTICES

FOR EROSION AND SEDIMENT CONTROL PLANS PLEASE
REFER TO THE EROSION AND SEDIMENT CONTROL PLANS
ENCLOSED WITH APPENDIX I

Silt Fence



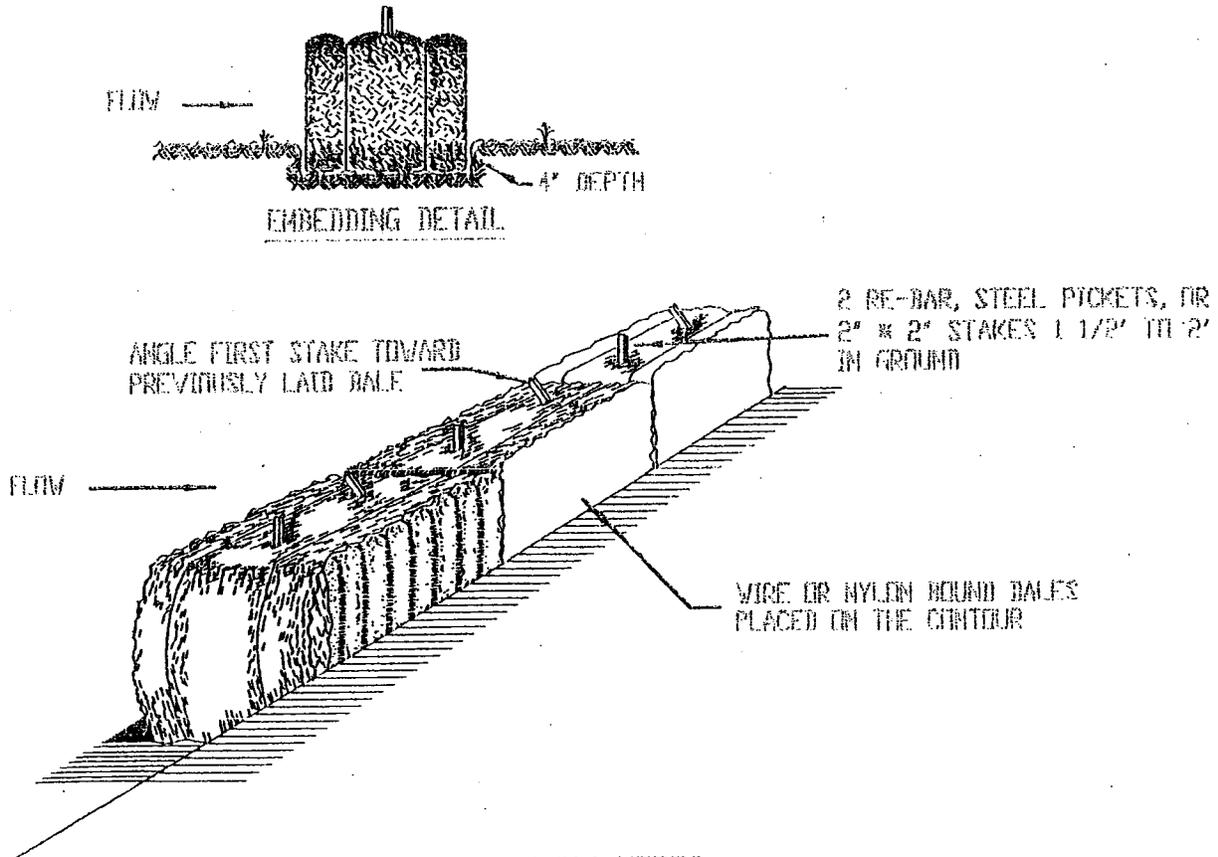
TOE-IN METHOD

JOINING SECTIONS OF FENCING

INSTALLATION NOTES

1. EXCAVATE A 4 INCH x 4 INCH TRENCH ALONG THE LOWER PERIMETER OF THE SITE.
2. UNROLL A SECTION AT A TIME AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (NET SIDE AWAY FROM DIRECTION OF FLOW).
3. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS APPROXIMATELY 2 INCHES FROM THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL THE TRENCH AND TAMP THE SOIL.
STEEPER SLOPES REQUIRE AN INTERCEPT TRENCH.
5. JOIN SECTIONS AS SHOWN ABOVE.

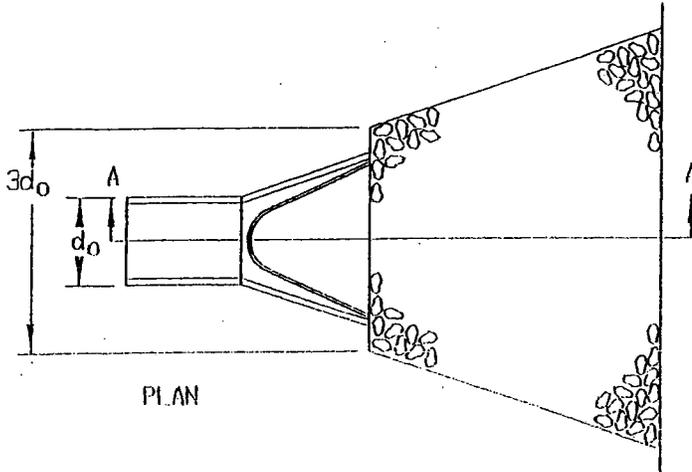
Strawbale Sediment Barriers



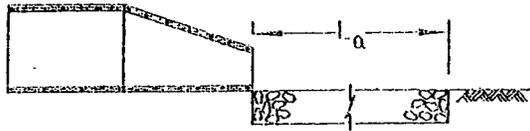
INSTALLATION NOTES

1. DALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT DALES.
2. EACH DALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4\" .
3. DALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BAR DRIVEN THROUGH THE DALES. THE FIRST STAKE IN EACH DALE SHALL BE ANGLED TOWARD PREVIOUSLY LAID DALE TO FORCE DALES TOGETHER.
4. DALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

Energy Dissipator

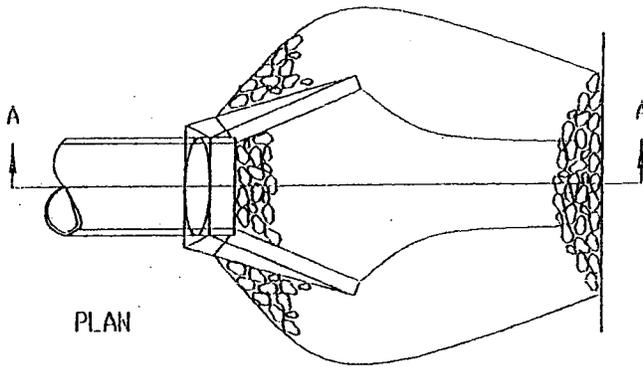


PLAN

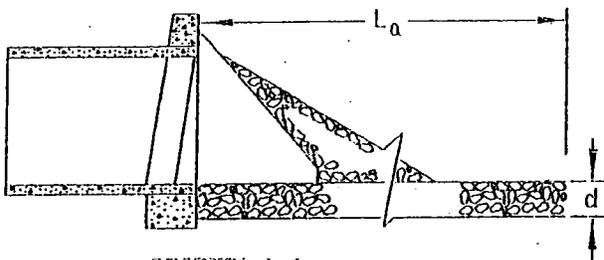


SECTION A-A

PIPE OUTLET TO FLAT AREA
WITH NOT DEFINED CHANNEL



PLAN



SECTION A-A

PIPE OUTLET TO WELL-DEFINED CHANNEL

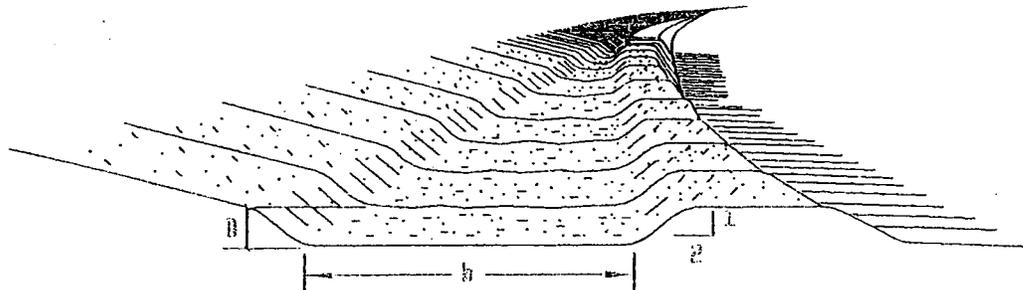
NOTES

1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, OR CONCRETE.
2. L_a IS THE LENGTH OF THE RIPRAP APRON
3. $d = 1.5$ TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6 INCHES.

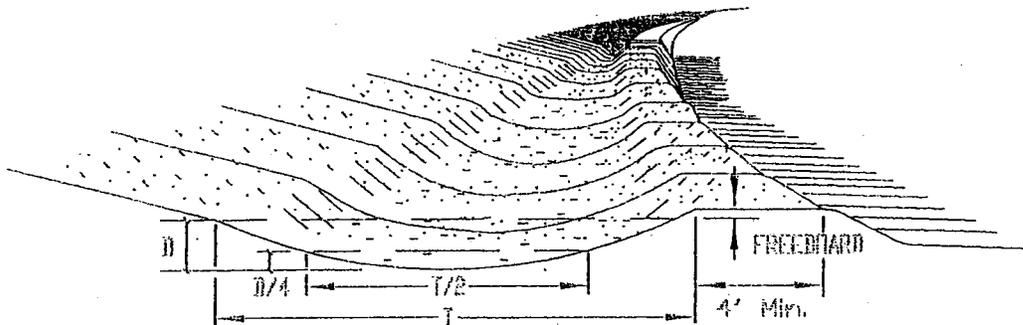
dissipator to be placed at outfall of the leaching swale at high street and at the base of the permanent stone swale located at the southwest corner of the site.

	entrance	sw corner
L_a	10'	20'
d_o	8"	swale
d	6"	12"

Diversion Swale



TRAPEZOIDAL CROSS - SECTION

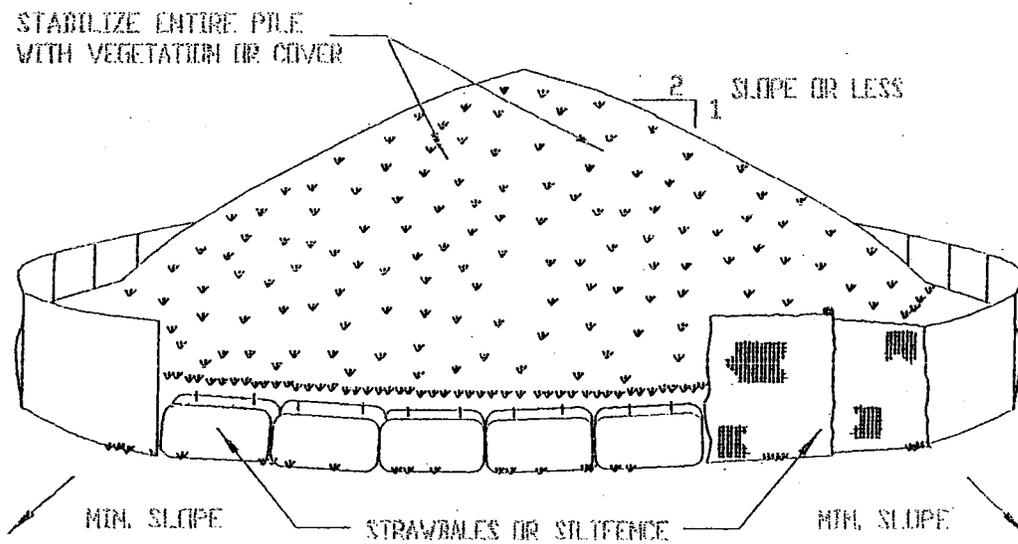


PARABOLIC CROSS - SECTION

INSTALLATION NOTES

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.
 - A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT. PER SEC., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY DIVERSIONS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE WATERWAY DURING THE ESTABLISHMENT OF THE VEGETATION.
 - B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT. PER SEC., THE WATERWAY SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE MESH OR MULCHING, AND TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.

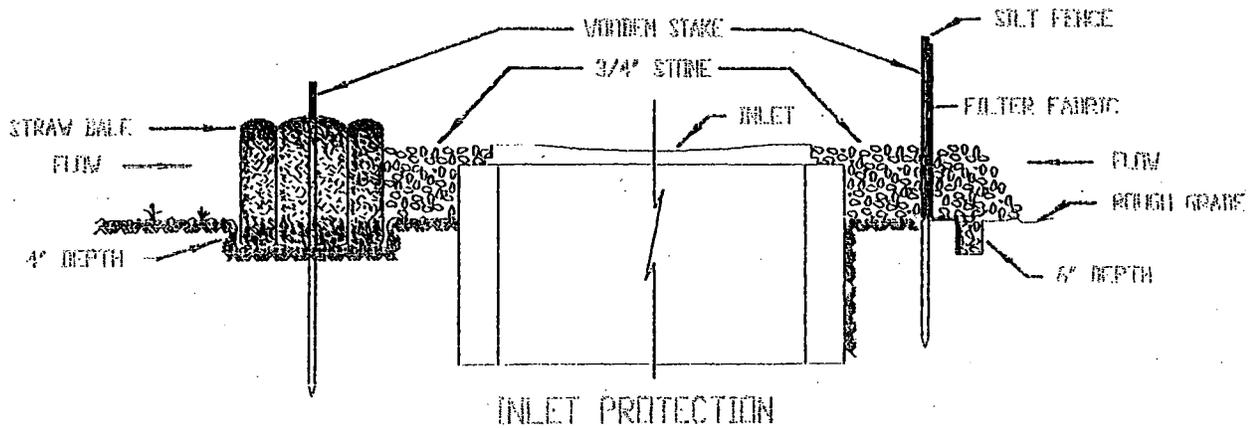
Soil Stockpiling



INSTALLATION NOTES

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES, THEN STABILIZED WITH VEGETATION OR COVERED.
4. SEE SPECIFICATIONS (THIS SHEET) FOR INSTALLATION OF SILTFENCE.

Inlet Protection



INSTALLATION NOTES

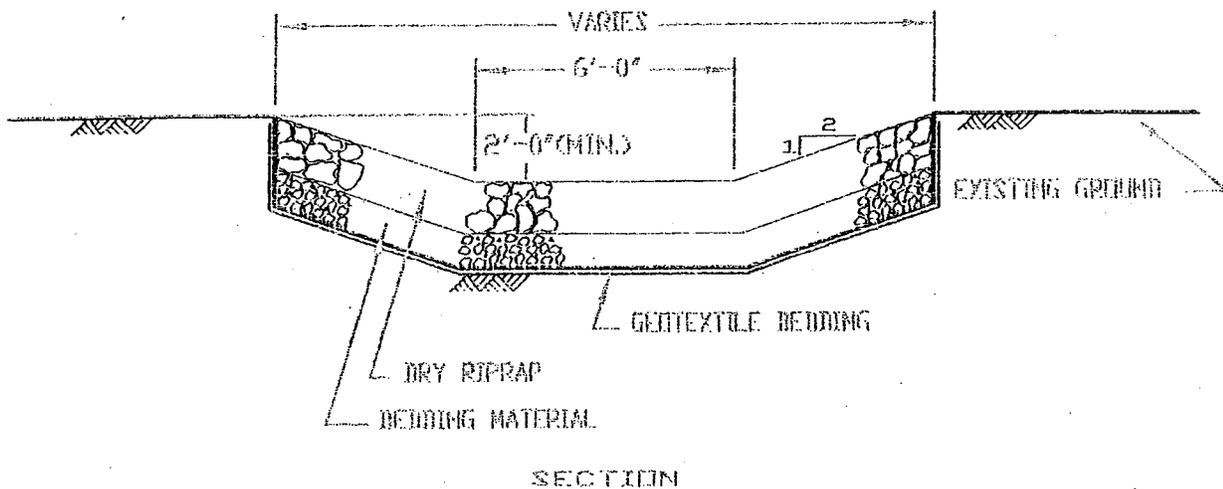
SILT FENCE

1. EXCAVATE A 6 INCH x 6 INCH TRENCH, OFFSET APPROXIMATELY 2 FEET FROM THE INLET PERIMETER.
2. UNROLL A SECTION AT A TIME AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (SET SIDE AWAY FROM DIRECTION OF FLOW).
3. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS APPROXIMATELY 2 INCHES FROM THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL THE TRENCH AND TAMP THE SOIL.
STEEPER SLOPES REQUIRE AN INTERCEPT TRENCH.
5. JOIN SECTIONS AS SHOWN ABOVE. SUPPLEMENT WITH GRAVEL, PILED AGAINST THE FENCE.

STRAW DALES

1. PLACE DALES OF STRAW WITH ENDS TIGHTLY ADJUTTING OTHER DALES TO SURROUND THE INLET. WHERE SLOPE AND SPACE PERMIT, ESTABLISH THE LINE OF DALES 2 TO 10 FEET AWAY FROM THE INLET. ANCHOR DALES IN PLACE BY DRIVING REBARS OR 2" x 2" STAKES THROUGH THE DALES. SUPPLEMENT WITH GRAVEL, PILED AGAINST THE DALES.
2. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
3. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION SHALL BE MINIMIZED.
5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

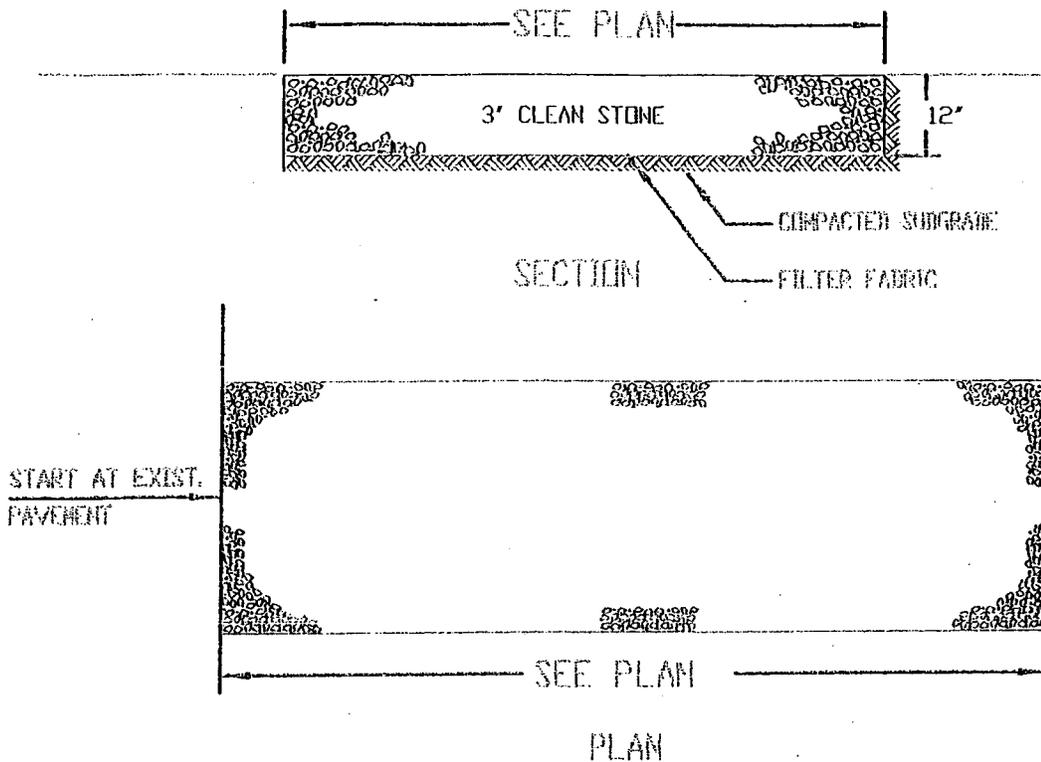
Riprap Lined Channel



INSTALLATION NOTES

1. THE FOUNDATION AREA SHALL BE CLEARED OF TREES, STUMPS, ROOTS, SOIL, LOOSE ROCK, OR OTHER OBJECTIONABLE MATERIAL.
2. THE CROSS-SECTION SHALL BE EXCAVATED TO THE NEAT LINES AND GRADES SHOWN ON THE PLANS. EVERY EXCAVATED AREA SHALL BE BACKFILLED WITH MOIST SOIL COMPACTED TO THE DENSITY OF THE SURROUNDING MATERIAL.
3. FILTER, BEDDING, AND ROCK RIPRAP SHALL BE PLACED TO LINE AND GRADE IN THE MANNER SPECIFIED.
4. NO ABRUPT DEVIATIONS FROM DESIGN GRADE OR HORIZONTAL ALIGNMENT SHALL BE PERMITTED.
5. CONSTRUCTION OPERATIONS SHALL BE DONE IN SUCH A MANNER THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED AND HELD WITHIN LEGAL LIMITS. ALL DISTURBED AREAS SHALL BE VEGETATED OR OTHERWISE PROTECTED AGAINST SOIL EROSION.

Stabilized Construction Entrance



INSTALLATION NOTES

1. STONE SIZE - USE 3" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS SHOWN, BUT NOT LESS THAN 60 FEET.
3. THICKNESS - NOT LESS THAN TWELVE (12) INCHES AT CONSTRUCTION ENTRANCE
- NOT LESS THAN SIX (6) INCHES FOR CONSTRUCTION ROAD AREAS
4. WIDTH - 25 FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCUR.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER CLOTH WILL NOT BE REQUIRED ON A SINGLE FAMILY RESIDENCE LOT.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DRIPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

APPENDIX G

BLANK NOTICE OF INTENT (NOI)



11906

Project Site Information



3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use	Post-Development Future Land Use
<input type="radio"/> FOREST	<input type="radio"/> SINGLE FAMILY HOME
<input type="radio"/> PASTURE/OPEN LAND	<input type="radio"/> SINGLE FAMILY SUBDIVISION
<input type="radio"/> CULTIVATED LAND	<input type="radio"/> TOWN HOME RESIDENTIAL
<input type="radio"/> SINGLE FAMILY HOME	<input type="radio"/> MULTIFAMILY RESIDENTIAL
<input type="radio"/> SINGLE FAMILY SUBDIVISION	<input type="radio"/> INSTITUTIONAL\SCHOOL
<input type="radio"/> TOWN HOME RESIDENTIAL	<input type="radio"/> INDUSTRIAL
<input type="radio"/> MULTIFAMILY RESIDENTIAL	<input type="radio"/> COMMERCIAL
<input type="radio"/> INSTITUTIONAL\SCHOOL	<input type="radio"/> ROAD\HIGHWAY
<input type="radio"/> INDUSTRIAL	<input type="radio"/> RECREATIONAL\SPORTS FIELD
<input type="radio"/> COMMERCIAL	<input type="radio"/> BIKE PATH\TRAIL
<input type="radio"/> ROAD\HIGHWAY	<input type="radio"/> SUBSURFACE UTILITY
<input type="radio"/> RECREATIONAL\SPORTS FIELD	<input type="radio"/> PARKING LOT
<input type="radio"/> BIKE PATH\TRAIL	
<input type="radio"/> SUBSURFACE UTILITY	
<input type="radio"/> PARKING LOT	
OTHER	OTHER
<input type="text"/>	<input type="text"/>

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? Yes No

5. Is this a remediation project conducted in accordance with a NYSDEC approved work plan? Yes No

6. Is this property owned by a state authority, state agency or local government? Yes No

7. In accordance with the larger common plan of development or sale; enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Project Site Acreage	Acreage to be Disturbed	Impervious Area within Disturbed
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/>

8. Will there be more than 5 acres disturbed at any given time? Yes No

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
<input type="text"/> <input type="text"/> <input type="text"/> %			



11906

Stormwater Pollution Prevention Plan (SWPPP)

Water Quality and Quantity Control



Important: Completion of Questions 24-30 is not required if the project:

Disturbs less than 5 acres and is planned for single-family residential homes (including subdivisions) or construction on agricultural property and does not have a discharge to a 303(d) water or is not located within a TMDL watershed.

Additionally, sites where there will be no future impervious area within the disturbed area and that do not have a change (pre to post development) in hydrology do not need to complete questions 24-30.

24. Indicate **all** the permanent Stormwater Management Practice(s) that will be installed on this site

Post Construction Stormwater Management Practices

Ponds

- Micropool Extended Detention (P-1)
- Wet Pond (P-2)
- Wet Extended Detention (P-3)
- Multiple Pond System (P-4)
- Pocket Pond (P-5)

Filtering

- Surface Sand Filter (F-1)
- Underground Sand Filter (F-2)
- Perimeter Sand Filter (F-3)
- Organic Filter (F-4)
- Bioretention (F-5)
- Other

Describe other stormwater management practices not listed above or explain any deviations from the technical standards. If the SWPPP does not conform to the technical standards, the SWPPP must be prepared and certified by a licensed/certified professional and is subject to a 60-business day review.

Wetlands

- Shallow Wetland (W-1)
- Extended Detention Wetland (W-2)
- Pond/Wetland System (W-3)
- Pocket Wetland (W-4)

Infiltration

- Infiltration Trench (I-1)
- Infiltration Basin (I-2)
- Dry Well (I-3)

Open Channels

- Dry Swale (O-1)
- Wet Swale (O-2)

Has a long term Operation and Maintenance plan for the post construction management practices been developed?

Yes No

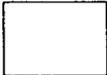
If Yes, Identify the entity responsible for the long term Operation and Maintenance

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



11906

**Stormwater Pollution Prevention Plan (SWPPP)
Water Quality and Quantity Control**



25. Provide the total water quality volume required and the total provided for the site.

Total Water Quality Volume (WQv)

WQv Required **WQv Provided**

. acre-feet
 . acre-feet

26. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required **CPv Provided**

. acre-feet
 . acre-feet

The need to provide for channel protection has been waived because

Site discharges directly to fourth order stream or larger

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development **Post-development**

. CFS
 . CFS

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development **Post-development**

. CFS
 . CFS

The need to provide for flood control has been waived because

Site discharges directly to fourth order stream or larger

Downstream analysis reveals that flood control is not required

IMPORTANT: For questions 27 and 28 impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s) (Total Drainage Area = Project Site + Offsite areas)

27. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins.

%

28. Post-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction.

%

29. Indicate the total number of permanent stormwater management practices to be installed

30. Provide the total number of stormwater discharge points from the site (include discharges to either surface waters or to separate storm sewer systems)

APPENDIX H

NYSDEC CERTIFICATION STATEMENT

2. OPERATOR'S CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal State and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law. "

Name (please print) _____

Title _____

Date: _____

Address: _____

Phone: _____

Email: _____

APPENDIX I

SITE PLANS

Appendix F

School Age Child Multipliers



June 21, 2005

Gary Lake, Chairman
Town of Wallkill Planning Board
600 Route 211 East
PO Box 398
Middletown, New York 10940

RE: School Enrollment Forecasts/Statistics regarding Golden Triangle

Dear Chairman Lake:

I was requested to review various statistics and enrollment analyses to provide an opinion on this information as it relates to the future development impacts to our local schools from new residential developments such as Golden Triangle. My background in this area dates back to the early sixties when I performed detailed school enrollment forecasts for municipalities and school districts in Bergen and Passaic Counties in New Jersey and in Orange County while I was Deputy Commissioner of the Orange County Planning Department. All those analyses were performed for municipalities, primarily during 1963-1978.

The purpose of this review was to determine the basic validity of the figures presented based on what we know from our own studies, other area studies and what has been occurring throughout Orange County. Since 1980-1984 planners have relied on the reference book "The Fiscal Impact Handbook" prepared at the Rutgers University Center for Urban Planning by Burchell and Listoken.

During the 1980's and 1990's all professional planners relied on these studies. In the late 1990's and up to now most school districts retain a group at Suffolk County BOCES to perform this work in addition to utilizing "The New Practitioners Guide to Fiscal Impact Analysis" by Burchell, Listoken and Dolphin and the more recent Urban Land Institute (ULI) studies.

While preparing a DEIS for a 314 unit single family subdivision in the Arlington School District in the Town of LaGrange in Dutchess County we were directed to the BOCES study by the School Board and Planning Board. The result was that the Suffolk BOCES figures for LaGrange and surrounding towns were surprisingly similar to the 1980-90 Rutgers studies.

These studies provide an average number of 0.8 to 1.0 public school children per dwelling unit from new and recently developed single family homes. For townhouses, apartments and other multifamily structures the numbers vary based on bedrooms from 0-0.2 for one bedroom dwellings to 0.2 to 0.5 for two and three bedroom dwellings.

Unless someone can demonstrate otherwise, based on a detailed study that these numbers are incorrect, they are the figures we recommend as the rate of enrollment for the towns in which we work as professional planners for Cornwall, Crawford, Chester, Monroe, Montgomery and Newburgh.

The next portion of my response is to specific letters and data sent to the Planning Board during the past five years.

First, is a letter from Robert H. Sigler, Jr. the former Superintendent of Schools in Middletown dated April 19, 2000. Mr. Sigler states there are 12,386 residential units and 6,314 students in the school district as of the 1999-2000 school year. Based on these statistics, Mr. Sigler comes up with 1.96 school-aged children per unit rather than 0.51. Unfortunately, Mr. Sigler divided residential units by school children rather than school children by residential units to obtain the ratio. Basically, these figures demonstrate one school-aged child for every two dwellings.

Even if the division had been done correctly it would be very simplistic and would not have addressed all the variables such as: senior citizen units, single family dwellings, apartments, townhouses or dwellings by size, age, value or cost and income levels. This is assuming that 12,386 is from the 2000 census and is an accurate number of units in the district.

Second, is a letter report from Mr. Salvatore J. La Bruna, Chairman of the Town of Walkill Conservation Commission. In the Commission's Findings under 1. Community Services, the Commission references the Urban Land Institute (ULI) as a source of the developers multiplier data for school children. ULI has been a reliable source for planners and municipalities as well as developers since the 1950's. It was their 1957 study that developed the basis for parking standards for shopping centers and residential developments used today nationwide. To refer to the website and who ULI provides information for and state it is not balanced is very misleading. It provides information for "leading property owners, investors, advisors, developers, architects, lawyers, lenders, planners, regulators, contactors, engineers, university professors, librarians, students and interns"; Who's missing? If that isn't balanced, nothing is!

Basically the ULI multipliers are similar to the Burchell, Listoken and Dolphin studies discussed above and similar studies of projects throughout the United States broken down by region.

Third, listed below are the multipliers from the Burchell and Listoken studies for the Mid-Atlantic States broken down in more detail from "The New Practitioner's Guide." They are broken down by housing type and bedroom count.

Dwelling Type

Single Family						
<u>Grade</u>	<u>1</u> <u>BR</u>	<u>2</u> <u>BR.</u>	<u>3</u> <u>BR.</u>	<u>4</u> <u>BR.</u>	<u>5</u> <u>BR.</u>	<u>All</u> <u>BR's</u>
K-6	----	.103	.472	.803	.997	.532
7-9	----	.032	.133	.305	.493	.180
<u>10-12</u>	----	<u>.030</u>	<u>.100</u>	<u>.220</u>	<u>.311</u>	<u>.135</u>
Total	----	.165	.705	1.328	1.801	.847

Apartments						
<u>Grade</u>	<u>1</u> <u>BR</u>	<u>2</u> <u>BR.</u>	<u>3</u> <u>BR.</u>	<u>4</u> <u>BR.</u>	<u>5</u> <u>BR.</u>	<u>All</u> <u>BR's</u>
K-6	.012	.165	.490	----	----	.144
7-9	.005	.046	.216	----	----	.039
<u>10-12.</u>	<u>.006</u>	<u>.036</u>	<u>.141</u>	<u>----</u>	<u>----</u>	<u>.032</u>
Total	.023	.247	.847	----	----	.175

Townhouses						
<u>Grade</u>	<u>1</u> <u>BR</u>	<u>2</u> <u>BR.</u>	<u>3</u> <u>BR.</u>	<u>4</u> <u>BR.</u>	<u>5</u> <u>BR.</u>	<u>All</u> <u>BR's</u>
K-6	.020	.111	.315	----	----	.231
7-9	.013	.037	.120	----	----	.089
<u>10-12.</u>	<u>.000</u>	<u>.020</u>	<u>.196</u>	<u>----</u>	<u>----</u>	<u>.063</u>
Total	.033	.168	.531	----	----	.383

These are 25 year old figures and today's figures are likely to be slightly lower. Also, figures will vary based on house value or price. Thus, the larger more expensive or more exclusive units will tend to have fewer school children. This was borne out in studies I personally prepared in 1965, 1973 and 1986.

In summary and after reviewing the proposed project, and statistics for current area projects, I believe a multiplier of 0.26 to be realistic. To be conservative in the analysis a figure of from 0.30 to 0.35 could be used, but far exceeds what I would expect to occur for two reasons.

First, the new projects, and Golden Triangle in particular, will be upscale and more expensive than most projects currently in the Scotchtown area of Wallkill including Schutt Road. Secondly, they will be surrounded by highways and highway ramps which is not conducive to parents with younger children. Such a project would have great access to commuter service and would be more likely to attract empty nesters than young families.

We are aware of no townhouse condominium projects or multifamily developments, regardless of age, in Orange County with multipliers above 0.5 school children per unit. The few projects shown with multipliers of 0.41-0.46 are all older 1970-1980 projects, which, up until a few years ago were selling for \$80-120,000. One of these in the applicants figures, Canterbury Knolls, is actually a detached three bedroom single family

development on smaller lots which is part of a home owners association. In terms of size they are similar to condominium townhouses.

Listed below, I have broken down the school children per unit and per bedroom for projects in the Town of Walkkill and the local school districts that I have personally review or rechecked. I find the following numbers for the current 2004-05 school year.

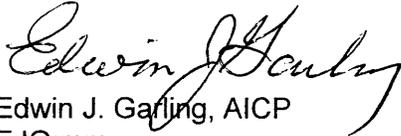
1. **Pine Hollow Estates** (Village of Chester) (Chester Schools)
32 dwellings, 20 one bedroom, 12 two bedroom apartments 3 school children
0.09 per dwelling/0.07 per bedroom
2. **Cambridge Manor** (Town of Walkkill) (Goshen Schools)
80 dwellings, 56 one bedroom, 24 two bedroom apartments-12 school children
0.15 per unit/0.12 per bedroom
3. **Country Squire** (Town of Walkkill) (Pine Bush Schools)
52 dwellings, 29 one bedroom, 23 two bedroom apartments-15 school children
0.29 per unit/0.20 per bedroom
4. **Middletown Village** (Town of Walkkill) (Middletown Schools)
88 dwellings, 60 one bedroom, 28 two bedroom apartments-20 school children
0.23 per unit/0.17 per bedroom
5. **Water's Edge** (Town of Walkkill) (Middletown Schools)
94 units-two bedroom Townhouse/condominium-8 school children
0.09 per unit/0.04 per bedroom
6. **Canterbury Knolls** (Town of Walkkill) (Middletown Schools)
185 units-three bedroom single family detached dwellings-87 school children
0.47 per unit, 0.16 per bedroom
7. **Hillside Village** (Town of Walkkill) (Goshen Schools)
120 dwellings, 40 one bedroom, 80 two bedroom condominiums-49 students
0.41 per unit/0.25 per bedroom
8. **Lake Ridge Estates** (Town of Walkkill) Middletown Schools)
31 dwellings, 20 two bedroom, 11 three bedroom condominiums-5 students*
0.16 per unit*/0.07 per bedroom*

***These numbers will increase as more units are built and the children age.**

The numbers above are based on information compiled from the Town of Walkkill Tax Assessors Office (2005), Enlarged City School District of Middletown, Mid-City Transit Office (2005), Goshen Central School District, Transportation Office (2005) and the Cambridge Manor rental office (2005).

We also reviewed data from other projects from Meadow Winds in Newburgh to projects in Westchester County and Monroe. Our office has first hand knowledge of the data from the Newburgh and Monroe projects and is able to confirm the accuracy of that data in particular. Much of the other available data was specifically requested by the Town of Newburgh Planning Board and reviewed relative to SEQRA submissions for the Brighton Green, Exeter and Orchard Hills condominium projects. Based on comparisons with comparable projects in Newburgh, New Windsor and Monroe the data was found to be acceptable and consistent.

Sincerely,

A handwritten signature in cursive script that reads "Edwin J. Garling". The signature is written in black ink and is positioned above the typed name.

Edwin J. Garling, AICP
EJG:mm



July 11, 2005

Gary Lake, Chairman
Town of Wallkill Planning Board
600 Route 211 East
PO Box 398
Middletown, New York 10940

RE: School Children Multipliers

Dear Mr.Lake:

On June 21, 2005 we submitted a report to the Planning Board in regard to public school aged children generated by various multifamily developments in the Town of Wallkill. We were requested to review this information by the applicant for the Golden Triangle project and submit a more formalized report.

Based on that request we reviewed our files and other projects to put together all figures obtained over the past year in regard to school children generation. Our prior report and the additional two page table of multipliers are provided for your use and perusal. We are prepared to discuss these numbers at your July 12th work session and at any public meetings. My analysis of this data is provided below.

Sources of Information

All data was developed at the request of the Planning Boards or the public during the review of projects before local Planning Boards in Orange County. Some data from outside the county is based on projects by developers who had built projects of a similar style in those communities. All data is based on tenant and owner roll information, school district transportation office interviews, school district personnel and professional planner and engineer staff review of subdivisions and assessment rolls. I personally reviewed, checked or gathered data on over one-third of these projects. Our office was involved in gathering or requesting data on all of the projects.

Personal discussions were conducted during the past few months with administrative staffs, principals and transportation personnel from the Goshen, Pine Bush and Minisink school districts.

Variations in Data

In reviewing the data you will note that some projects vary dramatically in the rates or multipliers. This is caused by a variety of factors including: location, cost of the units, landlord attitude about children in rentals, age of the unit and size of unit. The single family average multiplier is 0.76 or 76 public school age children per one hundred units while the number varies between 0.18 and 1.44. 0.18 or 18 per 100 is an upscale project in a wealthy Westchester town while 1.44 or 144 per 100 is a smaller much less expensive development in a rural Minisink school district attracting younger first home buyers with children.

If a detailed analysis of a substantial number of units at various price and age brackets was developed such information would provide a much clearer picture of impacts of various projects.

Changes in Society

When I performed my most detailed analyses in the mid sixties to seventies we were in the midst of the "baby-boomers" born between 1946 and 1964. Thus, by 1951 to 1969 the baby boomers were peaking in school enrollments. This was shown in an analysis that I did for Surrey Meadows in 1969 and later in 1978. In 1969 there were as many public school aged children as preschoolers. By 1973 the school age children peaked and by 1978 it was beginning to go back to 1969 levels and dropping.

Beginning in the eighties, younger adults began to get married later in life, being single was no longer a social issue and women had a greater choice of professions. Now young singles are buying houses and condos as an investment. Adults are living together and/or are choosing not to have children.

In summary, upscale single family projects and townhouses are likely to pay their way with school taxes in some districts and not in others. With rising real estate values the impacts are becoming more positive. A detailed analysis will reveal that data.

Sincerely,



Edwin J. Garling, AICP
EJG:mm
enclosure

SCHOOL CHILDREN POPULATION MULTIPLIERS (cont)
2004-2005 SCHOOL YEAR

DWELLING TYPE:	SCHOOL DISTRICT:	PROJECT NAME:	MUNICIPALITY:	# OF DWELLINGS	# OF CHILDREN	CHILDREN PER DWELLING:
TH/Condo	Dobbs Ferry UFSD	Livingston Ridge	Dobbs Ferry	24	3	0.13
	Newburgh ECSD	Meadow Winds	Newburgh	167	40	0.24
	Monroe-Woodbury CSD	Woodbury Heights	Woodbury	116	22	0.19
					Multiplier:	0.19
TH/SF	Monroe-Woodbury CSD	Mansion Ridge	Monroe	80	10	0.13
					Multiplier:	0.13
Single Family	Greenburgh CSD	Clarewood Village	Greenburgh	85	16	0.18
	Minisink Valley CDS	Ridgebury Estates	Waywayanda	73	58	0.80
	Minisink Valley CDS	Dawn Drive	Waywayanda	36	52	1.44
	Minisink Valley CDS	Kings Lane	Waywayanda	23	22	0.96
	Minisink Valley CDS	Laurel Hill	Waywayanda	21	11	0.52
	Minisink Valley CDS	Heselton	Waywayanda	25	22	0.88
	Minisink Valley CDS	Breeze Hill Estates	Waywayanda	27	21	0.78
	Minisink Valley CDS	Robinn Meadows	Waywayanda	123	105	0.85
	Middletown ECSD	Canterbury Knolls	Walkill	185	87	0.47
					Multiplier:	0.76
					Total Multiplier:	0.32

SCHOOL CHILDREN POPULATION MULTIPLIERS
2004-2005 SCHOOL YEAR

DWELLING TYPE:	SCHOOL DISTRICT:	PROJECT NAME:	MUNICIPALITY:	# OF DWELLINGS	# OF CHILDREN	CHILDREN PER DWELLING:
Apartment	Chester CSD	Pine Hollow Estates	Chester	32	3	0.09
	Goshen CSD	Cambridge Manor	Walkill	32	3	0.09
	Pine Bush CSD	Country Squire	Walkill	52	15	0.29
	Middletown ECSD	Middletown Village	Walkill	88	20	0.23
					Multiplier:	0.18
Townhouse	Hastings-on-Hudson CSD	Riverpointe Townhomes	Hastings	15	1	0.07
	Monroe-Woodbury CSD	Hidden Creek	Monroe	153	22	0.14
	Monroe-Woodbury CSD	Timber Hills	Monroe	168	35	0.21
					Multiplier:	0.14
Condo	Monroe-Woodbury CSD	Lexington Hills	Harriman	336	74	0.22
	Highland Falls CSD	Corbin Hill	Fort Montgomery	48	3	0.06
	Greenburgh CSD	Clarewood Club Condos	Greenburgh	40	4	0.10
	Goshen CSD	Hillside Village	Walkill	120	49	0.41
	Middletown ECSD	Water's Edge	Walkill	94	8	0.09
	Middletown ECSD	Lake Ridge Estates	Walkill	31	5	0.16
					Multiplier:	0.17

Representative School Age Child Multipliers

School Age Child Population Living in Surveyed Projects				
Project Name	Location	Number of Units	Total Number of Students	Demographic Multiplier (students per unit)
Surveyed Projects in Wallkill				
Source: Tim Miller Associates, Inc., 2005				
Waters Edge	Town of Wallkill	94 2BR townhouses	8	0.09
Lake Ridge Estates	Town of Wallkill	20 2BR, 11 3BR townhouses	5	0.16
Hillside Village	Town of Wallkill	40 1 BR, 80 2 BR townhouses	49	0.41
Surveyed Projects in Orange County				
Source: Tim Miller Associates, Inc., 2005				
Timber Hills	Town of Monroe	168 condominiums	35	0.21
Pine Ridge	Town of Monroe	78 condominiums	33	0.42
Mansion Ridge	Town of Monroe	80 condominiums	10	0.13
Lexington Hills	Village of Harriman	336 condominiums	75	0.22
Woodbury Heights	Town of Woodbury	116 condominiums	22	0.19
Meadow Winds	Town of Newburgh	167 condominiums	40	0.24
Parr Valley	Town of Newburgh	292 condominiums	61	0.21
Surveyed Projects in Westchester County				
Source: RH Consulting, 2003				
Clarewood Village	Town of Greenburgh	85 2BR townhouses	16	0.19
Clarewood Club	Town of Greenburgh	36 1BR, 2 2BR condominiums	4	0.11
Riverpointe	Village of Hastings	15 4BR townhouses	1	0.07
Hastings Landing	Village of Hastings	23 3BR townhouses	5	0.22
Livingston Ridge	Village of Dobbs Ferry	24 3BR townhouses	3	0.13
Marble Heights	Town of Mount Pleasant	24 3BR townhouses	11	0.46
Surveyed Projects in Westchester County Area				
Source: Marcon Realty, 2003				
Wyldwood	Town of Tarrytown	34 2BR, 55 3BR condominiums	14	0.16
Scarborough Glen	Village of Briarcliff Manor	20 2BR, 66 3BR condominiums	18	0.21
Chapel Hill	City of Peekskill	25 2BR, 72 3BR condominiums	11	0.11
Crystal Hill	Town of Pomona	144 2BR condominiums	33	0.23
Woodland Hills	City of Danbury CT	20 2BR, 67 3BR condominiums	23	0.26

Appendix G

Supplemental Traffic Impact Review

TABLE NO. 2-PM
 SUMMARY OF PROJECTED AND PLANNED DEVELOPMENT TRAFFIC VOLUMES FOR AREA INTERSECTIONS
 WEEKDAY PEAK PM HIGHWAY HOUR

	YEAR 2008 PROJECTED TRAFFIC VOLUMES	LAKE VIEW ESTATES	GUTTERMAN	DUPREE	MKA	TOWER RIDGE	PHASE I GOLDEN TRIANGLE	WALKHILL MANOR	KABRO	SCOTCH VALLEY	TOTAL	
											SITE GENERATED TRAFFIC VOLUMES	% of build % of other
1. NYS ROUTE 211 & SILVER LAKE - SCOTCHTOWN ROAD	2793	3 0.10 3.2	3 0.10 3.2	5 0.17 5.4	0 0.00 0.0	35 1.21 37.8	12 0.42 12.9	22 0.78 23.7	0 0.00 0.0	13 0.45 14.0	93 3.2 100	
2. NYS ROUTE 211 & BERT CRAWFORD ROAD / DUNNING ROAD	4143	9 0.20 3.6	9 0.20 3.6	12 0.27 4.8	54 1.23 21.5	41 0.83 18.3	27 0.61 10.8	26 0.59 10.4	44 1.00 17.5	29 0.66 11.6	231 5.7 100	
3. NYS ROUTE 211 & NYS ROUTE 17 - EB ON RAMP	4216	5 0.11 2.7	6 0.16 4.3	11 0.25 5.9	36 0.82 18.1	43 0.86 22.9	16 0.41 9.6	18 0.41 9.8	29 0.69 15.4	20 0.45 10.6	186 4.3 100	
4. NYS ROUTE 211 & NYS ROUTE 17 - WB ON / OFF RAMP	4821	3 0.06 2.0	4 0.08 2.7	6 0.16 5.3	21 0.41 14.0	66 1.30 44.0	11 0.22 7.3	11 0.22 7.3	15 0.30 10.0	11 0.22 7.3	150 3.0 100	
5. NYS ROUTE 211 & TOWER DRIVE / NORTH GALLERIA DRIVE	3901	0 0.00 0.0	1 0.02 0.7	3 0.07 2.0	27 0.67 17.9	80 1.97 53.0	9 0.22 8.0	6 0.20 5.3	14 0.35 9.3	9 0.22 6.0	151 3.7 100	
6. SILVER LAKE-SCOTCHTOWN ROAD & BERT CRAWFORD ROAD	916	6 0.50 2.1	14 1.16 4.9	15 1.25 5.2	54 4.48 18.9	19 1.56 8.6	45 3.74 15.7	41 3.41 14.3	44 3.66 15.4	48 3.99 16.8	286 23.8 100	
7. SILVER LAKE-SCOTCHTOWN ROAD & MUD MILLS ROAD	1384	4 0.24 1.3	14 0.82 4.5	3 0.18 1.0	91 5.36 29.0	25 1.47 8.0	48 2.83 15.3	15 0.86 4.8	65 3.71 20.1	51 3.00 16.2	314 18.5 100	
8. SILVER LAKE-SCOTCHTOWN ROAD & TOWER DRIVE	1280	2 0.14 1.5	3 0.21 2.2	2 0.14 1.5	37 2.81 27.4	37 2.81 27.4	12 0.85 8.9	11 0.78 8.1	19 1.34 14.1	12 0.85 8.9	135 9.5 100	
9. MUD MILLS ROAD & COTTAGE STREET EXTENSION	882	2 0.19 1.0	2 0.19 1.0	1 0.09 0.5	109 10.34 54.0	6 0.57 3.0	3 0.28 1.5	4 0.36 2.0	72 6.83 35.6	3 0.28 1.5	202 19.2 100	
10. SILVER LAKE-SCOTCHTOWN ROAD & NEELY STREET	726	2 0.24 2.0	5 0.61 5.1	6 0.97 8.1	0 0.00 0.0	13 1.58 13.1	18 2.16 18.2	34 4.12 34.3	0 0.00 0.0	19 2.50 19.2	99 12.0 100	
11. SILVER LAKE-SCOTCHTOWN ROAD & MALTESE DRIVE	577	0 0.00 0.0	3 0.48 6.1	5 0.80 10.2	0 0.00 0.0	0 0.00 0.0	9 1.44 18.4	22 3.51 44.9	0 0.00 0.0	10 1.60 20.4	49 7.8 100	
12. BERT CRAWFORD ROAD & MALTESE DRIVE	880	9 0.81 4.2	9 0.81 4.2	12 1.06 5.6	54 4.88 25.0	6 0.54 2.8	27 2.44 12.5	26 2.35 12.0	44 3.86 20.4	29 2.82 13.4	216 19.5 100	
13. TOWER DRIVE & INDUSTRIAL DRIVE	1160	0 0.00 0.0	1 0.08 0.7	0 0.00 0.0	27 2.06 18.2	60 6.12 54.1	9 0.89 6.1	6 0.81 5.4	14 1.07 9.5	9 0.89 6.1	148 11.3 100	
14. WISNER AVENUE & COTTAGE STREET EXTENSION	1087	2 0.16 3.6	2 0.16 3.6	2 0.16 3.6	9 0.79 18.4	6 0.53 10.9	3 0.26 5.5	4 0.35 7.3	24 2.10 43.8	3 0.26 5.5	55 4.8 100	

TABLE NO. 2-PM

SUMMARY OF COST ESTIMATES
FOR PROJECTED AND PLANNED DEVELOPMENTS FOR AREA INTERSECTIONS

WEEKDAY PEAK PM HIGHWAY HOUR

W/ ADDITIONAL IMPROVEMENTS

	APPROXIMATE COST OF IMPROVEMENT	LAKE VIEW ESTATES	GUTTERMAN	DUPREE	MIKA	TOWER RIDGE	PHASE I GOLDEN TRIANGLE	WALKHILL MANOR	KABRO	SCOTCH VALLEY	APPROXIMATE COST OF IMPROVEMENT
1. NYS ROUTE 211 & SILVER LAKE - SCOTCHTOWN ROAD	\$1,000	\$32	\$32	\$54	\$0	\$376	\$126	\$237	\$0	\$140	\$1,000
2. NYS ROUTE 211 & BERT CRAWFORD ROAD / DUNNING ROAD	\$5,000	\$179	\$179	\$236	\$1,076	\$817	\$538	\$218	\$876	\$578	\$5,000
3. NYS ROUTE 211 & NYS ROUTE 17 - EB ON RAMP	\$5,000	\$133	\$213	\$293	\$967	\$1,144	\$479	\$479	\$771	\$532	\$5,000
4. NYS ROUTE 211 & NYS ROUTE 17 - WB ON / OFF RAMP	\$5,000	\$100	\$133	\$267	\$700	\$2,200	\$367	\$367	\$500	\$367	\$5,000
5. NYS ROUTE 211 & TOWER DRIVE / NORTH GALLERIA DRIVE	\$15,000 to \$400,000	\$0 to \$0	\$69 to \$2,649	\$298 to \$7,947	\$2,682 to \$71,523	\$7,947 to \$211,921	\$884 to \$23,841	\$785 to \$21,182	\$1,361 to \$37,096	\$884 to \$23,841	\$15,000 to \$400,000
6. SILVER LAKE-SCOTCHTOWN ROAD & BERT CRAWFORD ROAD	\$100,000	\$2,098	\$4,895	\$5,245	\$18,881	\$6,643	\$15,734	\$14,336	\$15,365	\$16,763	\$100,000
7. SILVER LAKE-SCOTCHTOWN ROAD & MUD MILLS ROAD	\$5,000 to \$50,000	\$64 to \$637	\$223 to \$2,229	\$48 to \$478	\$1,449 to \$14,480	\$388 to \$3,861	\$764 to \$7,643	\$239 to \$2,386	\$1,003 to \$10,032	\$812 to \$8,121	\$5,000 to \$50,000
8. SILVER LAKE-SCOTCHTOWN ROAD & TOWER DRIVE	\$100,000 to \$150,000 to \$50,000	\$1,481 to \$2,222 to \$741	\$2,222 to \$3,333 to \$1,111	\$1,481 to \$2,222 to \$741	\$27,407 to \$41,111 to \$13,704	\$27,407 to \$41,111 to \$13,704	\$8,886 to \$13,333 to \$4,444	\$6,148 to \$12,222 to \$4,074	\$14,074 to \$21,111 to \$7,037	\$8,886 to \$13,333 to \$4,444	\$100,000 to \$150,000 to \$50,000
9. MUD MILLS ROAD & COTTAGE STREET EXTENSION	\$225,000	\$2,228	\$2,228	\$1,114	\$121,411	\$6,683	\$3,342	\$4,455	\$80,198	\$3,342	\$225,000
MUD MILL REALIGNMENT	\$150,000	\$1,485	\$1,485	\$743	\$80,841	\$4,455	\$2,228	\$2,970	\$53,465	\$2,228	\$150,000
10. SILVER LAKE-SCOTCHTOWN ROAD & NEELY STREET	\$2,000	\$40	\$101	\$162	\$0	\$263	\$364	\$987	\$0	\$364	\$2,000
11. SILVER LAKE-SCOTCHTOWN ROAD & MALTESE DRIVE	\$2,000	\$0	\$122	\$204	\$0	\$0	\$367	\$886	\$0	\$408	\$2,000
12. BERT CRAWFORD ROAD & MALTESE DRIVE	\$115,000	\$4,792	\$4,792	\$8,396	\$28,750	\$3,184	\$14,375	\$13,843	\$23,428	\$15,440	\$115,000
13. TOWER DRIVE & INDUSTRIAL DRIVE	\$100,000	\$0	\$676	\$0	\$18,243	\$54,654	\$6,081	\$5,405	\$9,459	\$6,081	\$100,000
14. WISNER AVENUE & COTTAGE STREET EXTENSION	\$10,000	\$364	\$364	\$364	\$1,636	\$1,081	\$545	\$727	\$4,364	\$545	\$10,000
TOTAL COST	\$1,890,000 to \$1,475,000	\$16,586 to \$16,586	\$24,438 to \$24,988	\$20,339 to \$27,988	\$372,439 to \$442,280	\$175,469 to \$379,442	\$88,517 to \$103,464	\$72,768 to \$83,185	\$245,093 to \$274,788	\$83,321 to \$106,788	TOTAL COST \$1,890,000 to \$1,475,000



CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

Memo

To: John F. Ward, Jr. – Town of Wallkill Supervisor
From: Bernie Kalus and Katie Duffy
CC: Steve Smith
Date: 9/22/2005
Re: Additional Mitigation Measures for the Wallkill Comprehensive Traffic Impact Study

The Town of Wallkill Town Board retained Chas. H. Sells, Inc. (SELLS) to perform an independent review of the Wallkill Comprehensive Traffic Impact Study, prepared by John Collins Engineers, P.C. in 2003. The Collins' Study was funded by the Applicants of the Golden Triangle, Wallkill Manor Apartments, and Kabro development projects and evaluated the impact of the additional traffic generated by the almost 1,100 dwelling units listed in Table 1. These nine projects are in various stages of review and there are concerns regarding the adequacy of the mitigation measures included in the Comprehensive Traffic Study. While the study provides a detailed examination of existing traffic operations and the potential impacts to service levels at each of the 14 study area intersections, the report did not include an analysis of roadway safety nor did it evaluate the ability of the roadway segments connecting these intersections to safely accommodate the increased volume of traffic.

Subsequent to our initial review of the Collins' Report, SELLS prepared a detailed accident analysis in July and August of 2005 using the latest three years of accident reports from the Town of Wallkill Police Department. This memorandum summarizes the results of the accident analysis, which was performed for the Town-owned roadways included in the Wallkill Comprehensive Traffic Impact Study. As discussed during our September 1, 2005 meeting the accident data has been further refined to sort the records by time of day, time of year, and weather conditions to address the issues raised by some of the Town Board members during our discussions. We have also prepared a list of supplemental recommendations designed to improve roadway features that may be contributing factors in the number of incidents at the high accident locations. In addition, a list of long-term corridor improvements has been provided for your review, which can be used to establish design guidelines in reviewing future infrastructure improvements, utility upgrades, or development projects.

Taken together, the improvements proposed as part of the Wallkill Comprehensive Traffic Impact Study and the additional recommendations included in this memo, provide the Town with a roadway network that will operate at an acceptable level of service, while also addressing the contributing factors to the high accident locations that may be exacerbated by the increased demand from the nine projects currently in front of the Planning Board. It should be noted that this analysis does not include the traffic generated by Golden Triangle Phase II or any future development projects outside the study area boundaries. Phase II of Golden Triangle includes the construction of a new road between Silver Lake Scotchtown Road and NYS Route 211. The creation of this new connection has the potential to change travel patterns and the evaluation of this project's impacts will be part of the Build-out traffic study that will include all of the potential development for the Scotchtown, Millburn and Circleville sections of Wallkill.

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Table 1 – Development Projects Included in the Walkkill Comprehensive Traffic Impact Study		
Project Name	Development Type	Number of Units
Kabro	Age Restricted Housing	283
Walkkill Manor	Apartment Units	104
Dupree	Condominiums	30
Lake View Estates	Single Family Homes	9
Gutterman	Single Family Homes	12
Golden Triangle Phase I	Townhouses	96
Scotch Valley	Single Family Homes	55
Tower Ridge	Apartment Units	192
MKA*	Single Family and Townhouses	46 – Single Family 254 - Townhomes
Total Units		1,081

* MKA Development originally contained 182 single family homes, 160 multi-family apartments and retail development. The units shown in Table 1 have been taken from the latest version of the developer's proposed building plan.

Roadway Safety Study and Short-Term Recommendations

The accident analysis focused on the Town-owned roads and revealed that there are five intersections in the study area that have accident rates above the statewide average for similar facilities. See Figure 1 for the location of the high accident intersections and a statistical summary of the accident types and causes. An accident is considered “correctable” if it can be correlated to any non-standard physical feature that can be improved. At four of the five high accident locations correctable features were identified and these non-standard features are the basis for the additional improvement recommendations. A summary of the accident analysis and additional improvement measures at each of the high accident locations is provided below.

- *Tower Drive & Silver Lake Scotchtown Road (SLSR)* - Rear end and left turn accidents were the most prevalent types of incidents at this intersection, with a cluster of accidents associated with vehicles waiting to make a left turn from SLSR to Tower Drive. Vehicles traveling south on SLSR have limited sight distance to vehicles waiting to make a left turn onto Tower Drive. The installation of a traffic signal at this location has the potential to increase the queue length and exacerbate this sight distance condition. Similarly, the installation of the proposed signal will result in northbound queues on SLSR at the Tower Drive intersection, which also has limited stopping sight distance. Currently there is no signal and northbound SLSR traffic experiences free flow operations. To help mitigate these conditions it is recommended that a southbound left turn and northbound right turn lane be installed on SLSR as part of the signal installation project. Detailed survey information should also be obtained to determine if sight distance improvements can be performed on SLSR without impacting the bridge over NYS Route 17.
- *Mud Mills Road and Cottage Street* – Run-off-the-road incidents accounted for almost half of the recorded accidents at this location. The nonstandard sight distance and horizontal geometry on this segment of Mud Mills Road may be contributing factors in these accidents. Poor pavement conditions may have also been an issue, since over 40% of these accidents occurred when the pavement was either wet or covered with snow, ice, or slush. The installation of a new traffic signal will make stopping conditions more difficult since the existing intersection is located on a nonstandard curved segment of Mud Mills Road. It is recommended

that the Mud Mills & Cottage Street intersection be realigned to provide better sight distance to the new signalized intersection.

- *Mud Mills Road and Silver Lake Scotchtown Road (SLSR)* – Similar to the Mud Mills Road/Cottage Street intersection, the majority of the accidents were in an area with non-standard stopping sight distance and nonstandard horizontal geometry. A pattern of rear end collisions and run-off-road accidents were observed on the Mud Mills approach to the intersection, where the nonstandard horizontal curve obstructs sight distance to the signal and vehicles waiting to turn onto SLSR. There was also a cluster of run-off-road and fixed object collisions on the SLSR approaches to the intersection. Weather and roadway conditions may have also been a contributing factor in these accidents, since more than half of the recorded incidents occurred when the pavement surface was either wet or covered in snow and/or ice. It is recommended that the horizontal curve on the Mud Mills Road approach to the intersection be realigned to improve sight distance conditions. In addition, the pavement on both roadways should be reconstructed to provide better cross slopes and drainage along with a new high friction wearing course. Fixed objects along the roadsides should be removed wherever possible due to the high frequency of run-off-road incidents.
- *Silver Lake Scotchtown Road and Bert Crawford Road* – While the accident rate exceeds the statewide averages for similar intersections, there are no patterns or clusters of incidents that can be attributed to any geometric feature or roadway condition. It is recommended in the Walkkill Comprehensive Traffic Study and the John Collins summary of improvements to continue to monitor the intersection for a future traffic signal. Based on the study it is recommend that a signal be installed and coordinated with the timing of the existing signal at Mud Mills Road.
- *Tower Drive and Industrial Drive* – Rear end accidents were the most prevalent types of accidents at this location, accounting for over 40% of the reported incidents. Run-off-road and animal related accidents accounted for an additional 29% of the total accidents. Weather and pavement conditions may have been contributing factors since almost 60% of the reported accidents at this intersection occurred during rainy and/or snowy conditions. The roadway improvements proposed as part of the new Town Hall facility are designed to reduce the number of driveway access points along both roadways and should help to reduce the number of rear-end incidents. Additional drainage and roadway surfacing improvements should be incorporated as part of the construction plans to address the pattern of weather and surface related accidents at this location.

Table 2, below, summarizes the additional recommended improvements at each of the above referenced high accident locations along with the original mitigation measures proposed as part of the Walkkill Comprehensive Traffic Impact Study.

Long-term Corridor Improvements

As shown in Figure 2, Silver Lake Scotchtown Road, Cottage Street, Mud Mills, Road, and Bert Crawford Road contain a number of geometric features that do not conform to current design standards. In addition, to the improvements recommended at the high accident locations, a corridor-wide improvement program should be considered to upgrade the roadways to Resurfacing, Restoration and Rehabilitation (3R) standards. The 3R standards are intended to preserve and extend the service life of existing roadways through a cost effective design that focuses on safety related improvements. Using this approach, the travel lanes would be a consistent 11 feet in width and shoulders of at least 2 feet would be constructed wherever possible. Severely nonstandard horizontal and vertical curves would be reconstructed, where possible, and objects within the clear zone would be removed, relocated, shielded, or replaced as a breakaway object.

As we discussed at the meeting, there are a number of potential funding sources for these improvements, including developer contributions, and federal/state funding under the Federal Highway Administration's Locally Administered Federal Aid program.

We hope this memo is helpful in evaluating the potential impacts to the Town's roadway infrastructure. The additional recommendations should be considered as potential mitigation measures for the projects included in

the Wallkill Comprehensive Traffic Impact Study and any future development's that rely on these roadway corridors. Please feel free to contact me should you have any questions or comments on this matter and we look forward to meeting again with you to discuss these issues in greater detail.

Table 2 – Roadway Intersection Improvements

INTERSECTION	REQUIRED IMPROVEMENT	ADDITIONAL MITIGATION
SilverLake-Scotchtown Road & Bert Crawford Road	Future traffic signal: continue to monitor for signalization	Progress installation of signal Coordinate timing w/Mud Mills @ SLSR
SilverLake-Scotchtown Road & Mud Mills Road	Signal timing phasing improvements	Realign Mud Mills approach Repave w/high friction wearing coarse Remove roadside obstructions
SilverLake-Scotchtown Road & Tower Drive	Installation of new traffic signal system	Construct a SB left turn lane on SLSR Improve sight distance through profile modifications Possible NB right turn lane on SLSR
Mud Mills Road/Cottage Street Extension	Signal roadway grading, intersection upgrade	Realign Mud Mills Provide better sight distance to new signalized intersection
Cottage Street Railroad underpass	Signal control and interconnect with Mud Mills signal	-
Bert Crawford & Maltese Drive	Traffic signal installation and coordination with NYS Route 211 signal	Consideration of one-way traffic flow on Maltese Drive
Tower Drive & Industrial Drive	Signal installation	Coordinate with Town Hall improvements



The Town of Wallkill

Review of the

Wallkill Comprehensive Traffic Impact Study

September 1, 2005

Introduction

- ❑ Established in 1925, Chas. H. Sells, Inc. (SELLS) is the largest engineering firm located in the Hudson Valley
- ❑ For 80 years, SELLS has been providing comprehensive transportation design and civil engineering services, including:
 - Highway Design
 - Bridge Design & Inspection
 - Traffic & Transportation
 - Land Surveying
 - Utility Planning/Relocation
 - Municipal Services
 - Construction Inspection
 - Photogrammetry & GIS

Walkkill Comprehensive Traffic Impact Study

Project	Development Program	AM	PM	SAT
Kabro	282 Age Restricted	82	96	80
Walkkill Manor	104 Apartments	55	75	62
Dupree	30 Condominiums	20	23	23
Lake View Estates	9 Single Family Homes	16	12	22
Gutterman	12 Single Family Homes	17	16	22
Golden Triangle Ph. I	96 Townhouses	50	60	60
Scotch Valley	55 Single Family Homes	48	63	60
Tower Ridge	192 Apartments	98	123	98
MKA	46 Single Family & 254 Townhouses	150 (220)	183 (289)	168 (258)
Totals	1,080 Dwelling Units	536	651	595

Study Approach

- Phase One
 - Review Comprehensive Report
 - Study methodology
 - Reasonableness of assumptions
 - Comparison with actual operating conditions
 - Effectiveness of mitigation measures
 - Provide conclusions and recommendations
- Phase Two
 - More Detailed Analysis (if required)
 - Additional issues
 - Traffic capacity modeling
 - Revised mitigation measures

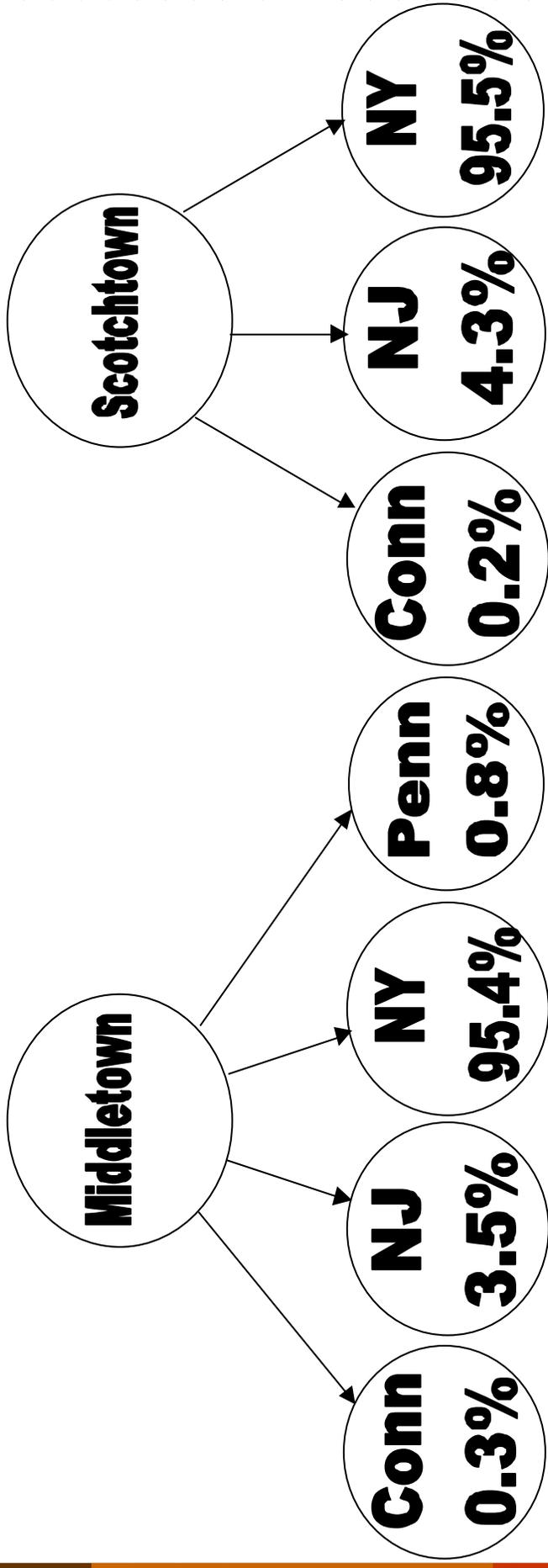


Review Issues

- ❑ Intersections operate consistently
- ❑ Except Tower Drive/North Galleria Drive (left)

	Approach	Chas. H. Sells Observed Delay	John Collins Calculated Delay
Weekday PM (June 9, 2005)	NBL	177s	77.2s
Saturday (June 4, 2005)	NBL	75s	72.5s
	SBR	52s	21.4s

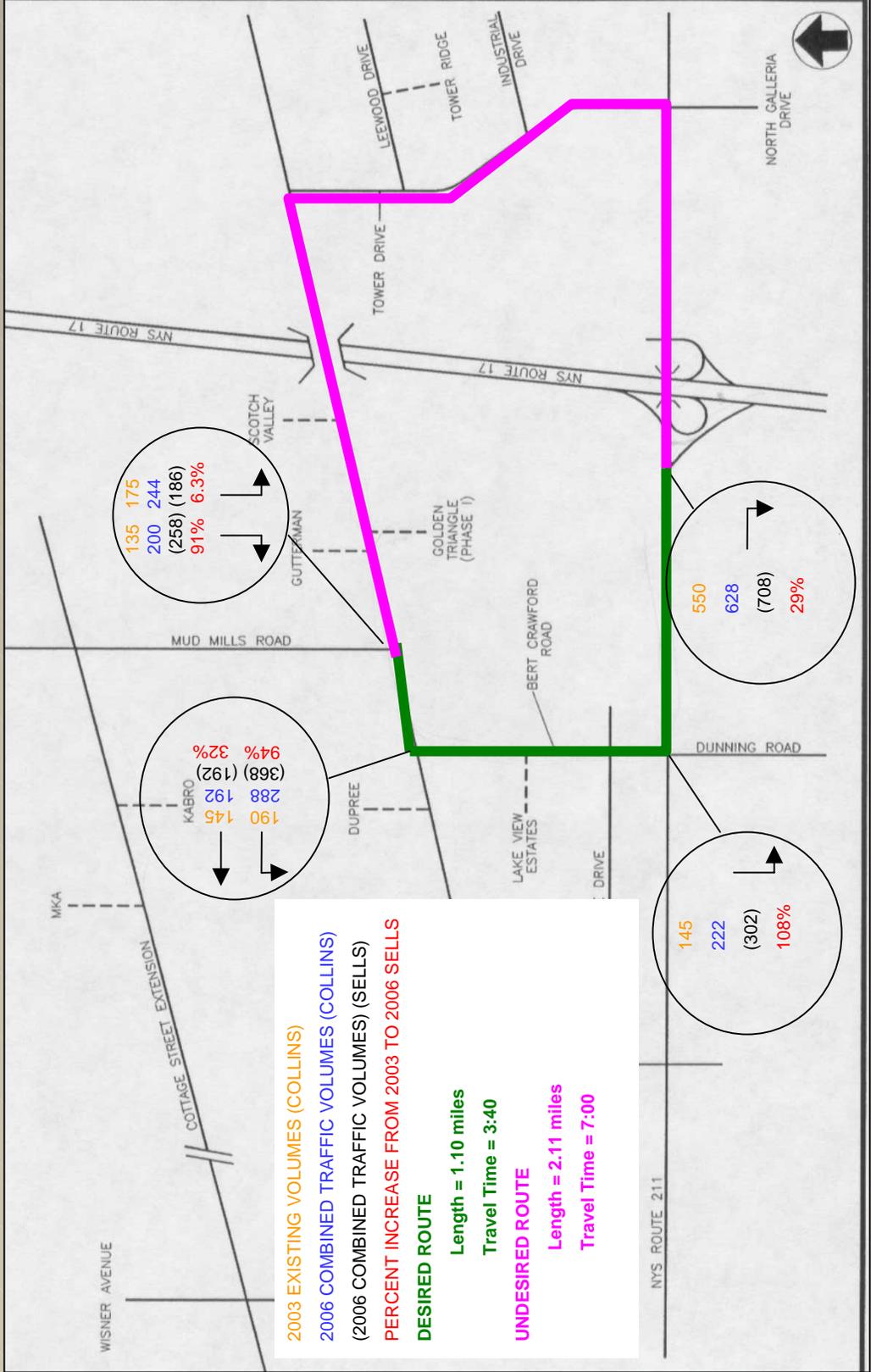
Journey-to-Work



- 47% will use Route 17 to get to work

- 63% will use Route 17 to get to work

Proposed Trip Distribution

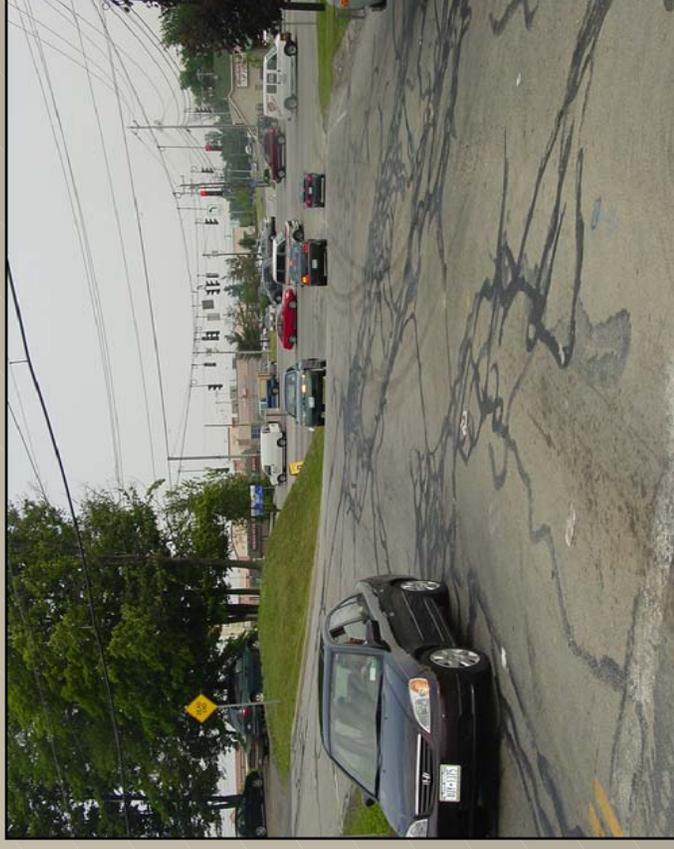


Additional Issues

- Accidents and safety
- Condition of existing roads
 - Impacts due to Construction
- Affects of Mitigation on Roadway Safety
- Design Standards for Collector Roads
 - Bert Crawford Road
 - Silver Lake-Scotchtown Road
 - Mud Mills Road

Accidents & Safety

- ❑ Analysis to determine existing high accident locations
- ❑ Impacts of project generated traffic on safety
- ❑ Potential countermeasures



Bert-Crawford/Maltese Drive
intersection

Condition of Existing Roads



Looking east on Maltese Drive

- ❑ Distressed pavement
- ❑ Unknown foundation
- ❑ Impacts of project generated trips
- ❑ Construction Traffic impacts on pavement condition



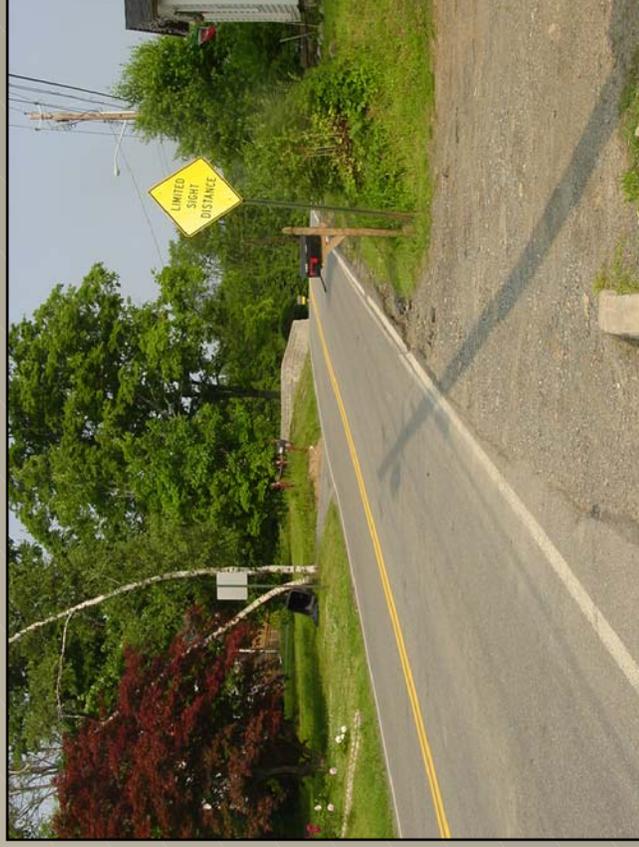
Impacts of Mitigation

- Road Safety
 - Increased queue lengths from proposed signals on Silver-Lake/Scotchtown Road



Design Standards

- ❑ No shoulder, limited sight distance, roadside obstructions



Design Standards-Collector Roadways

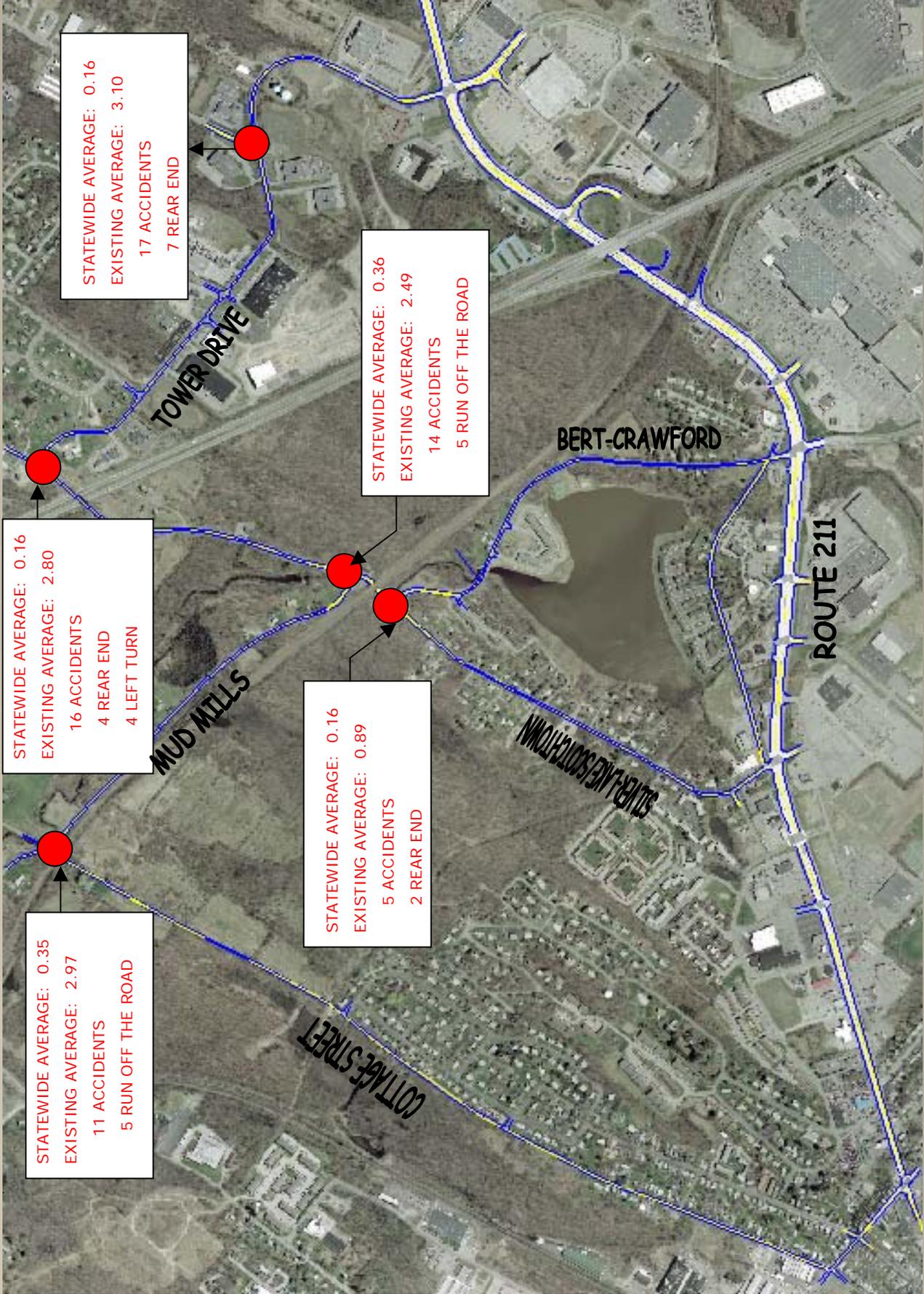
- AASHTO Definition of Collector Roads
 1. Spaced @ intervals consistent w/ population
 2. Serve smaller communities
 3. Link locally important traffic generators with the arterial system
- Mud Mills Road, Silver Lake-Scotchtown Road, and Bert Crawford function as Collector Roads

Design Criteria

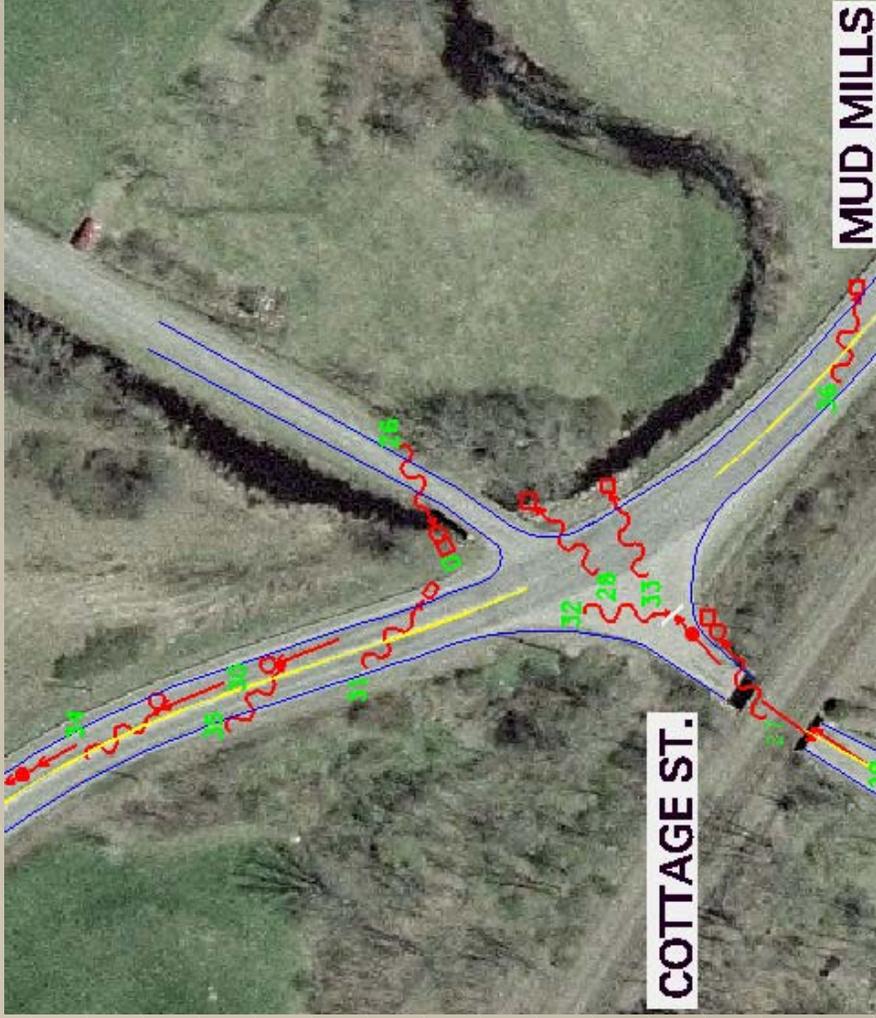
□ Rural Collector Roadway

Design Feature	Design Value	Remarks
Design Speed	40 mph	Based on 30 mph posted speed, speed study recommended
Sight Distance	305 feet	1,470 feet required for passing
Horizontal curve	485 feet	Minimum curve based on 6% max. superelevation
Roadway width	24 feet	22' may be retained based on accident analysis
Shoulder width	8 feet	Shoulder can be reduced as long as 30' of pavement is maintained

Accident Rates



High-Accident Locations



- Existing Problems
 - Pattern of fixed object collisions
 - Run-off-road accidents
- Additional Mitigation
 - Realign Mud Mills
 - Provide better sight distance to new signalized intersection

STATEWIDE AVERAGE: 0.35
EXISTING AVERAGE: 2.97
11 ACCIDENTS
5 RUN OFF THE ROAD

High Accident Locations

- Existing Problems
 - Cluster of Rear-end collisions on Mudd Mills approach
 - Run-off-road and fixed object collisions on Silver-Lake Scotchtown Road
- Additional Mitigation
 - Realign Mud Mills approach
 - Repave with high friction wearing coarse
 - Remove roadside obstructions



STATEWIDE AVERAGE: 0.36
EXISTING AVERAGE: 2.49
14 ACCIDENTS
5 RUN OFF THE ROAD

High Accident Locations

- Existing Conditions
 - No clusters or patterns
- Additional Mitigation
 - Progress the installation of signal
 - Coordinate timing with Mud Mills @ Silver-Lake/Scotchtown Road



STATEWIDE AVERAGE: 0.16
EXISTING AVERAGE: 0.89
5 ACCIDENTS
2 REAR END

High Accident Locations



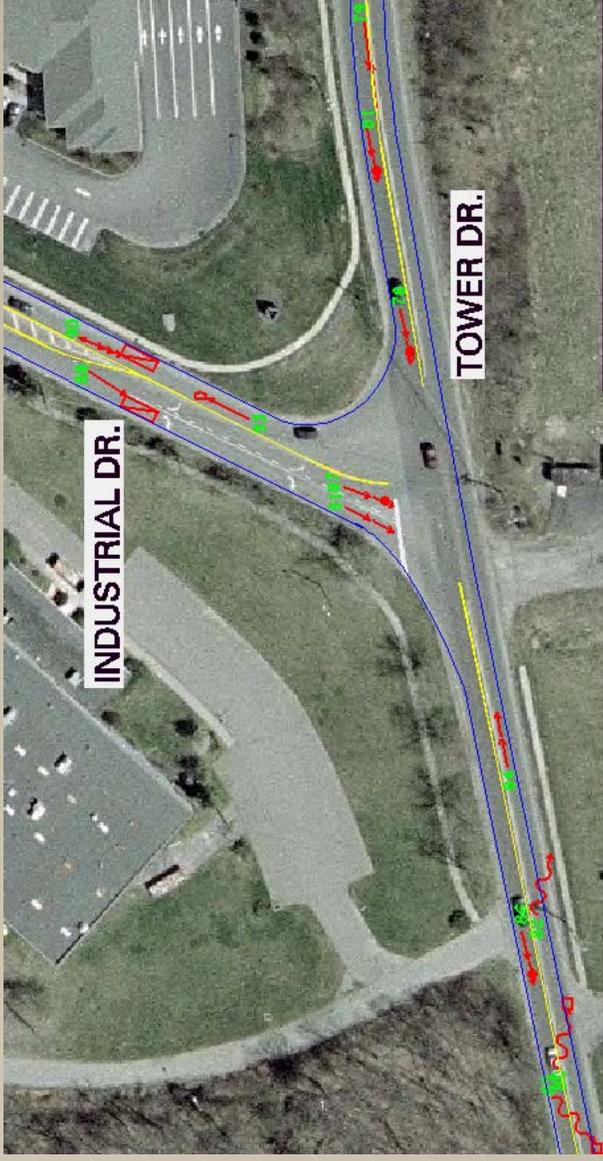
STATEWIDE AVERAGE: 0.16

EXISTING AVERAGE: 2.80

16 ACCIDENTS
4 REAR END
4 LEFT TURN

- Existing Problems
 - Pattern of rear-end collisions on SLSR
 - Limited sight distance on EB approach to Tower Drive
- Additional Mitigation
 - Construct a SB left turn lane on SLSR
 - Improve sight distance through profile modifications
 - Possible NB right-turn lane on SLSR

High Accident Locations



- Existing Conditions
 - Rear end collisions on Industrial Drive & WB Tower Drive approaches
 - Parked car accidents on Industrial Drive
- Additional Mitigation
 - Coordinate with Town Hall Improvements

Corridor Improvements

- Bring roads up to at least 3R-standards
 - Resurfacing, restoration and rehabilitation
 - Intended to preserve and extend the service life of existing roadways

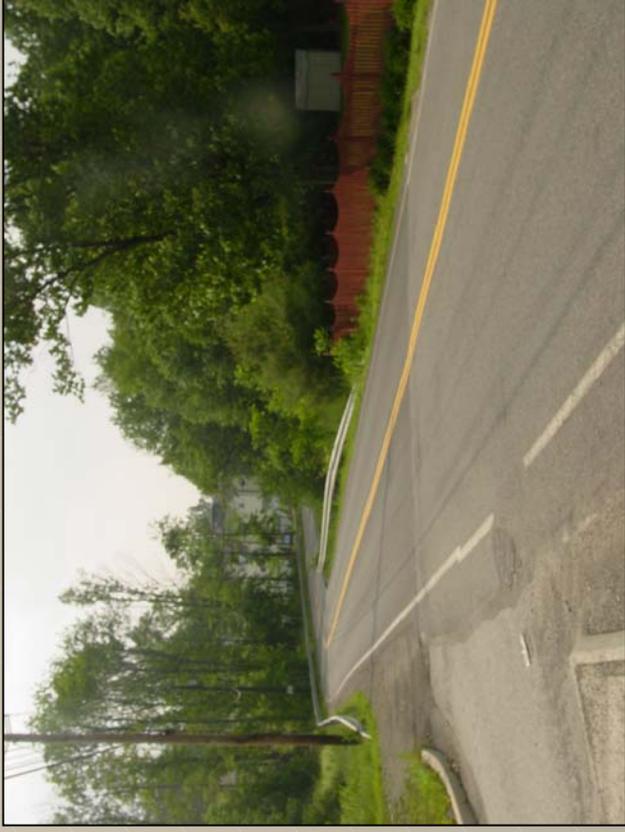
- Bert-Crawford
- Mud Mills
- Silver-Lake/Scotchtown
- Cottage Street



Looking north on Bert-Crawford

Corridor Improvements

- ❑ Standard width for lanes & shoulders
- ❑ Standard clear zones
- ❑ Improve Non-Standard curves to 3R



Looking north on Bert-Crawford



Looking NE on Cottage Street

Traffic Analysis Zones

WALLKILL

Circleville

Fair Oaks

Washington Heights

Scotchtown

MIDDLETOWN

EAST MIDDLETOWN

NYS Route 17

Route 302

I-84

Route 211

TAZ	TOTAL HOUSING UNITS	COMMERCIAL
393	1362	1162712 ft ²
408	96	95187 ft ²
411	2	914394 ft ²
413	1120	477818 ft ²

393

408

413

411

Next Steps

- Updated Traffic Counts in September
 - Check accuracy of report projections
 - Make necessary revisions
- Complete Evaluation of Golden Triangle Phase II Project
- Progress Build-out Evaluation of Impacts to Road Corridors
- Identify Funding Sources for Corridor Improvements
 - Project mitigation
 - Federal funding through local roads project – 3R Improvement

