ATTACHMENT 1

(1-1)

AGENDA
Joint Town/University Committee
Development Plan Modification: Cobb Deck and Northeast Chiller Plant
Center for Dramatic Arts
July 31, 2003

10:00 a.m.	1.	Welcome and introductions	Chairman Williams
10:10 a.m.	2.	Opening remarks	Chairman Williams and Mayor Foy
10:20 a.m.	3.	Presentation of Cobb Deck and Northeast Chiller Project	Bruce Runberg
10:30 a.m.	4.	Overview of University's chiller system and review of alternate chiller sites	Bruce Runberg
10:40 a.m.	5.	Discussion of chiller issues	Committee
10:55 a.m.	6.	Presentation of University's transportation strategy and implementation progress	Carolyn Elfland
11:10 a.m.	7.	Presentation of proposed traffic mitigation measures	George Alexiou
11:20 a.m.	8.	Discussion of transportation and transit issues	Committee
11:35 a.m.	9.	Public comment	Community Members
11:50 a.m.	10.	Closing remarks	Mayor Foy and Chairman Williams

(1-2)

Division of Finance & Administration

Facilities Planning & Construction

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

North East Chiller and Parking Deck

Total Projected Budget: $36,072,700

Fund Sources:

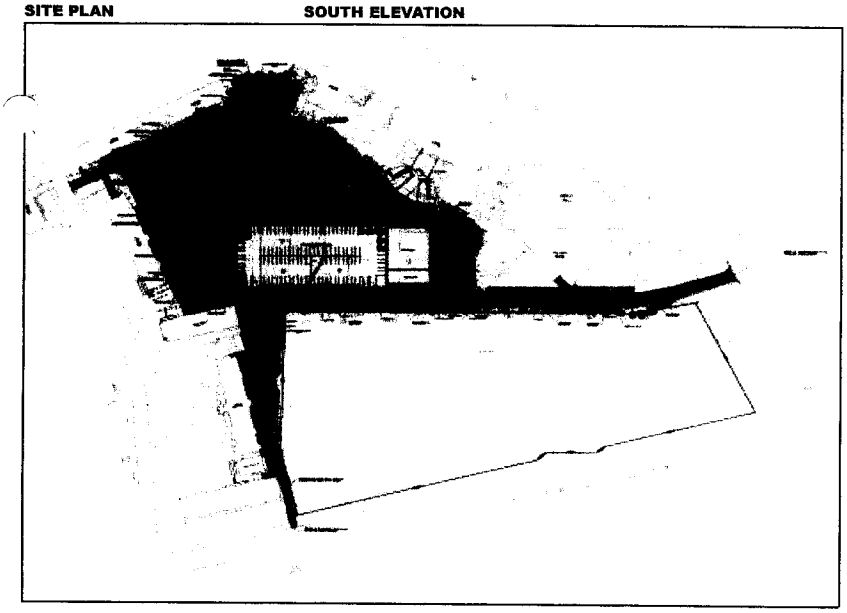
State Bond: $12,000,000

S/L-Parking: $12,830,000

S/L-Utilities: $11,242,700

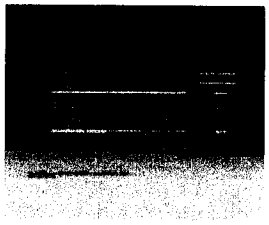
Completion: Spring/Summer 2005

SITE PLAN



SOUTH ELEVATION

WEST ELEVATION



Design Team:

Affiliated Engineers

CLH Design, PA

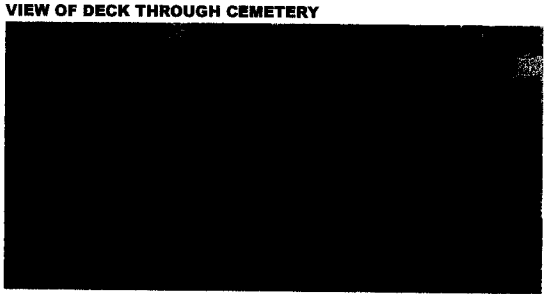
Martin/Alexiou/Bryson, PLLC

Stewart Acoustical Consultants

Walker Parking Consultants

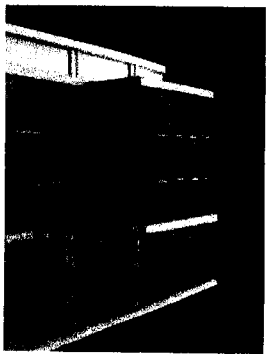
Walter, Robbs, Callahan & Pierce, Architects, PA

VIEW OF DECK THROUGH CEMETERY



SITE MODEL

BUILDING MODEL



The University of North Carolina at Chapel Hill is planning a combination Chiller and Parking Deck for the area behind Cobb Hall, the Center for Dramatic Arts and the Old Chapel Hill Cemetery. Currently, the site consists of about 370 parking spaces and 11 tennis courts. The deck will include 600 parking spaces for a net gain of about 230 spaces after the existing surface parking is removed. A 10,000 ton capacity chiller plant will be incorporated into the design of the deck. By integrating the chiller into the deck, the mechanical elements can be hidden and noise mitigated.

The parking deck will provide parking for staff, faculty, visitors, and for patrons of after-hour events, such as PlayMakers productions in Paul Green Theatre and nearby athletic events. The chiller plant will supply chilled water to meet the cooling needs of buildings in the northeast part of campus. The parking deck will be clad in brick, with precast stone accents. The facade will be designed to complement the surrounding buildings and will have louvered and metal grilled openings. The parking deck will have five levels of parking with the overall height of the building being consistant with neighboring buildings. The chiller area will extend above the northeast corner of the deck but will be shielded from view by dark gray metal panels. An important aspect of the parking deck/chiller project is the landscape plan for the remainder of the site. The existing surface parking and tennis/basketball courts will be removed. Six new tennis courts and one basketball court will be built. The remaining area will be landscaped to provide green plazas and brick walkways that will provide a safe and pleasant pedestrian environment.

(1-3)

Traffic Mitigation

Neighborhood Concerns

- Pedestrian safety
- Delays to traffic exiting Gimghoul Road

Traffic Mitigation

- Included in Modification #1:
  - User restrictions
  - Two access points
- Additional:
  - Traffic signal at Gimghoul Rd.
  - Reversible lane access to South Rd.

User Restrictions

- Until recently, parking lot open to anyone at 5 PM
- "Rush" of traffic in just after 5 PM (3 times rate of a typical commuter lot)
- At same time exiting traffic 50% higher than typical commuter lot
- Permit spaces in new deck will be restricted to permit holders until later in evening, or allocated to PGT ticket holders

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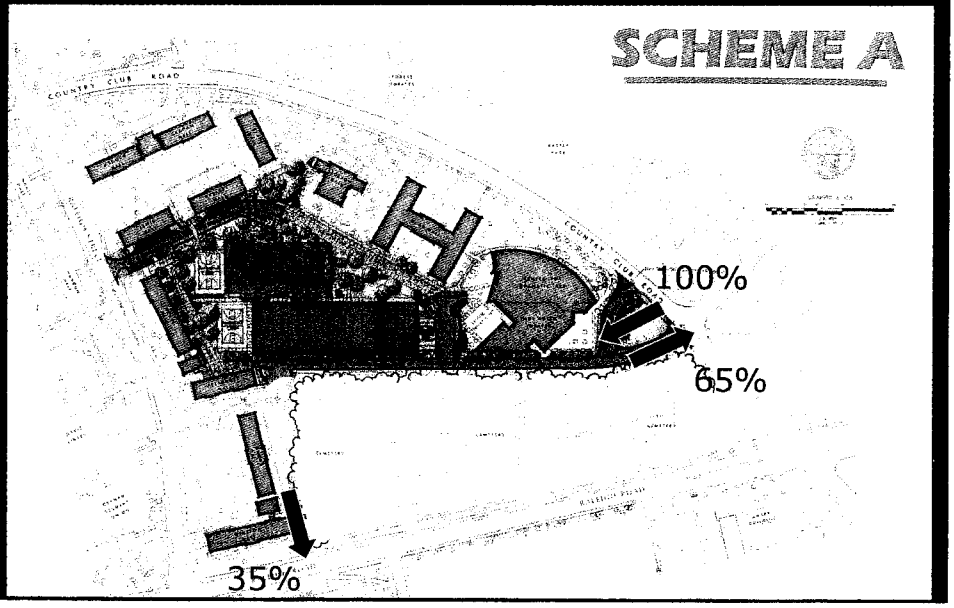
User Restrictions

Access Arrangements-Mod #1



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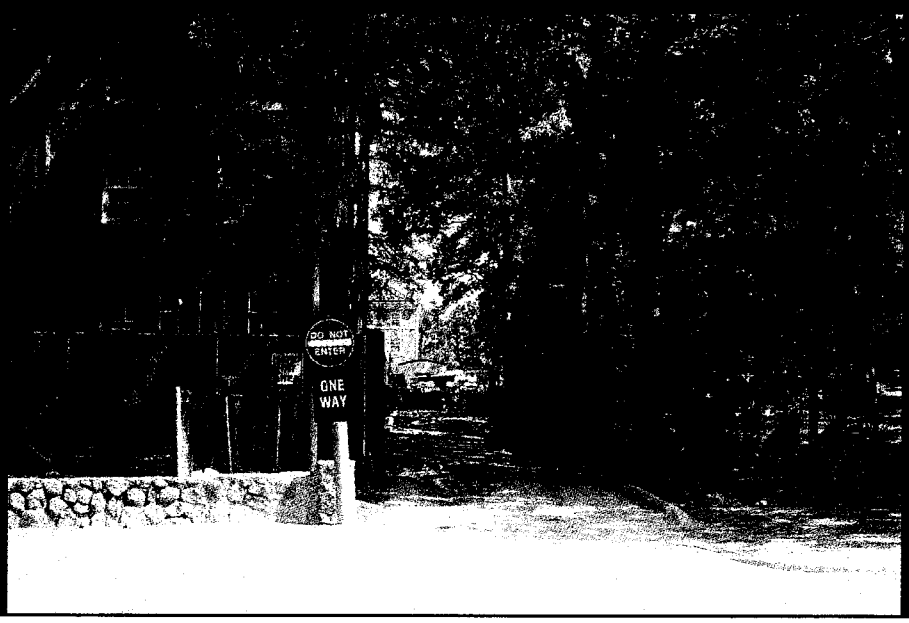
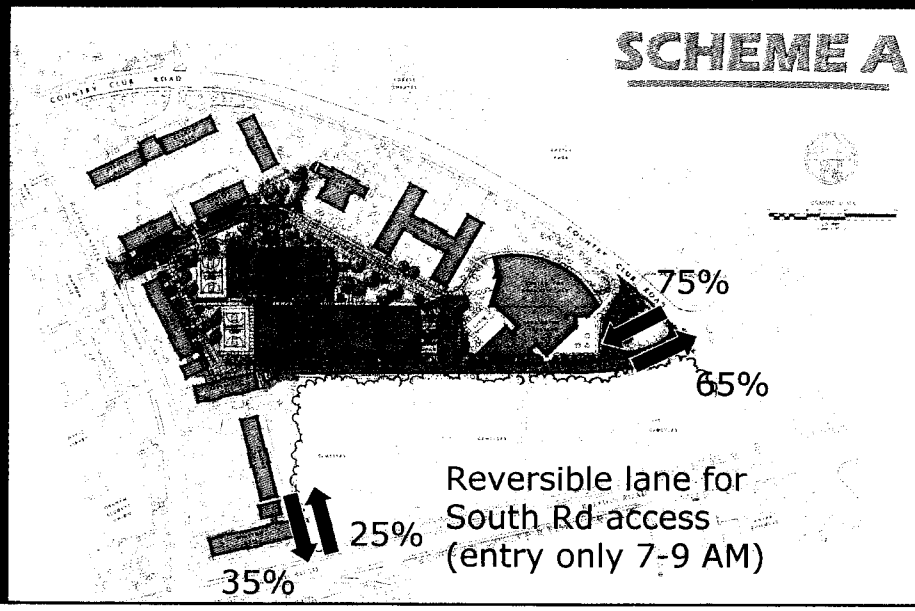
Access Arrangements-Revised



Access Arrangements-Revised



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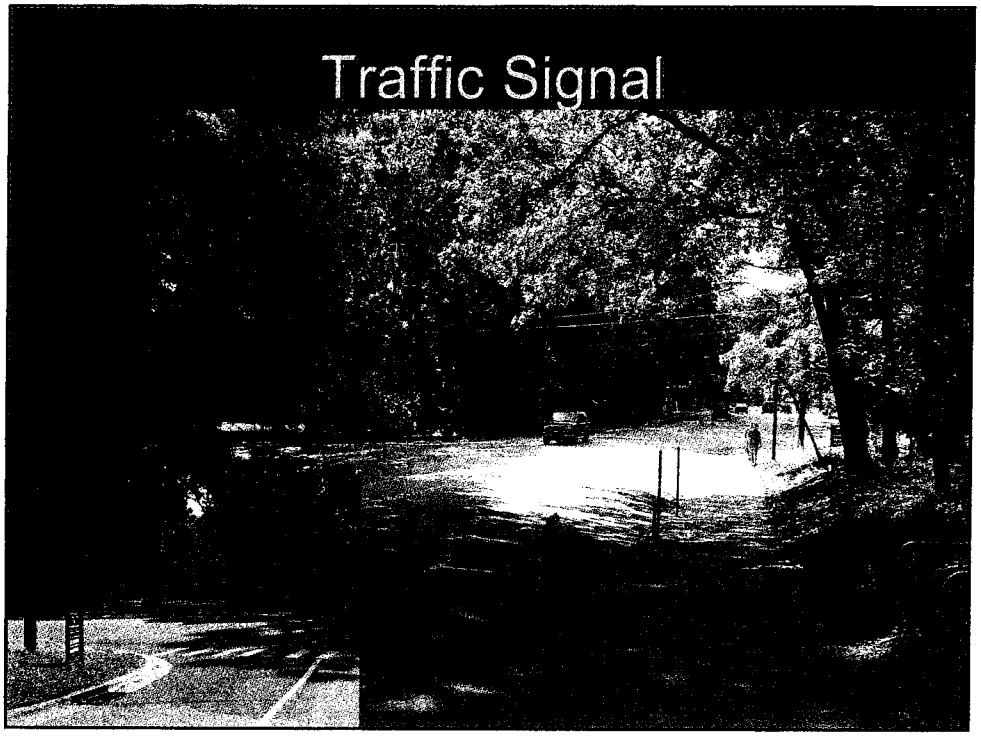
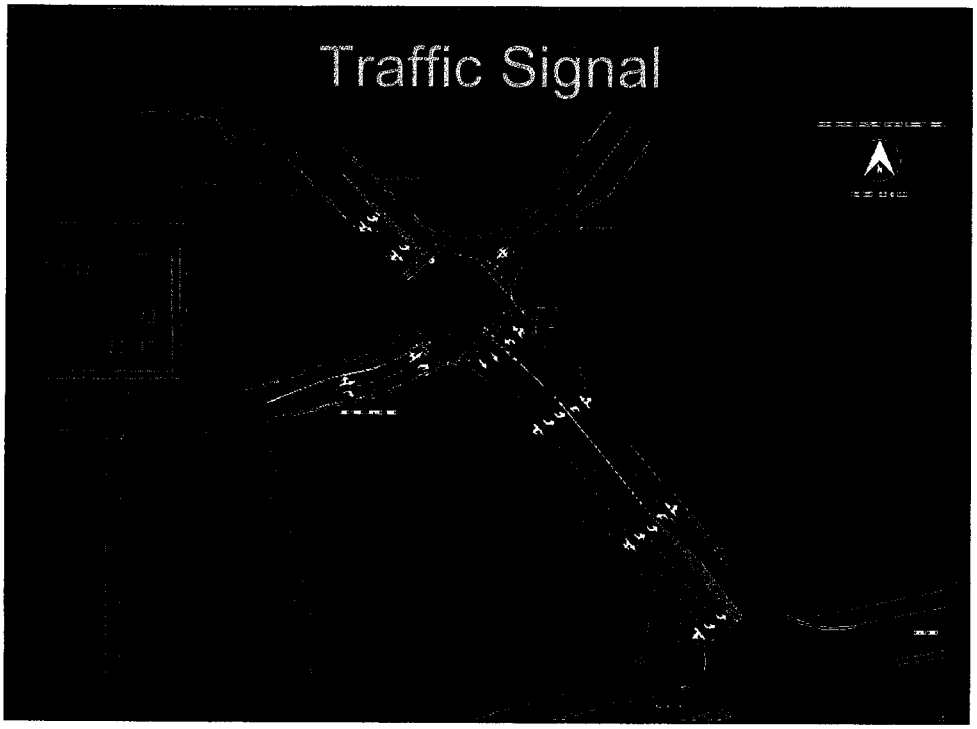
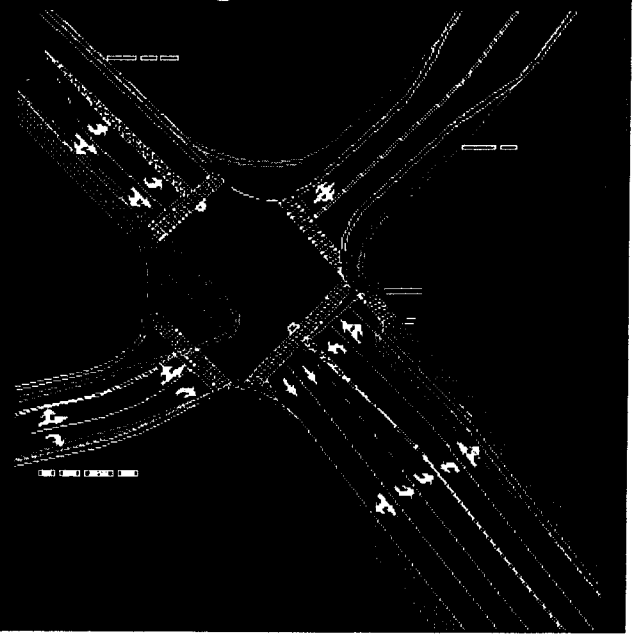




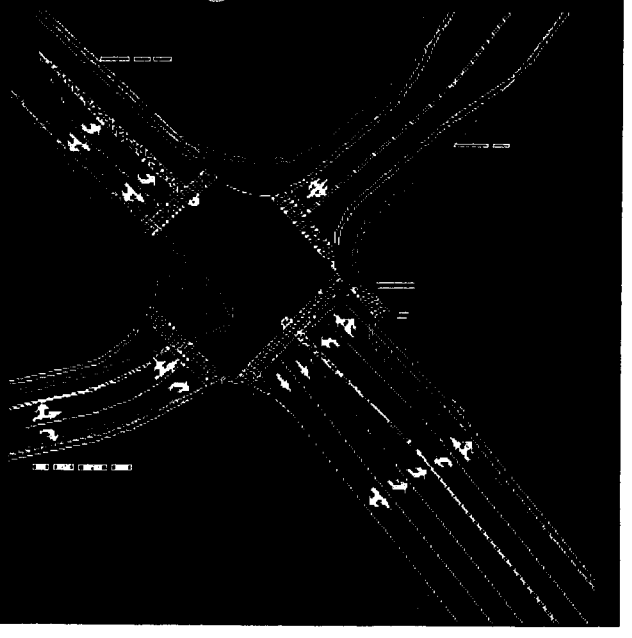
Traffic Signal

- Eliminates potential delays to Gimghoul Rd. traffic
- Narrowing Gimghoul Rd. entrance discourages cut-through traffic



Traffic Signal

- Intersection will operate at Level-of-Service A
- Improvements at South/ Country Club maintain existing overall intersection LOS



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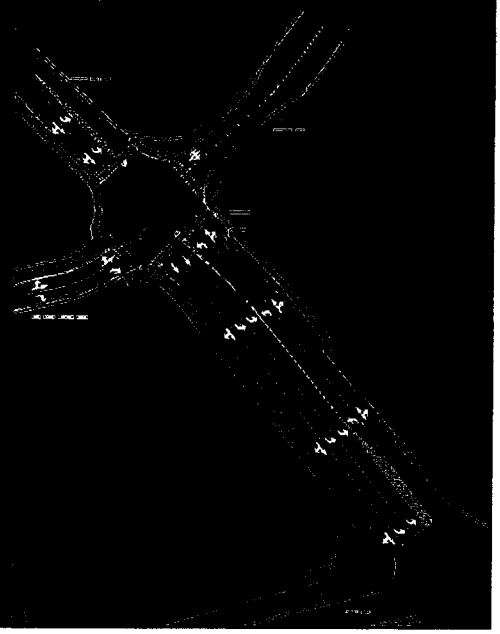
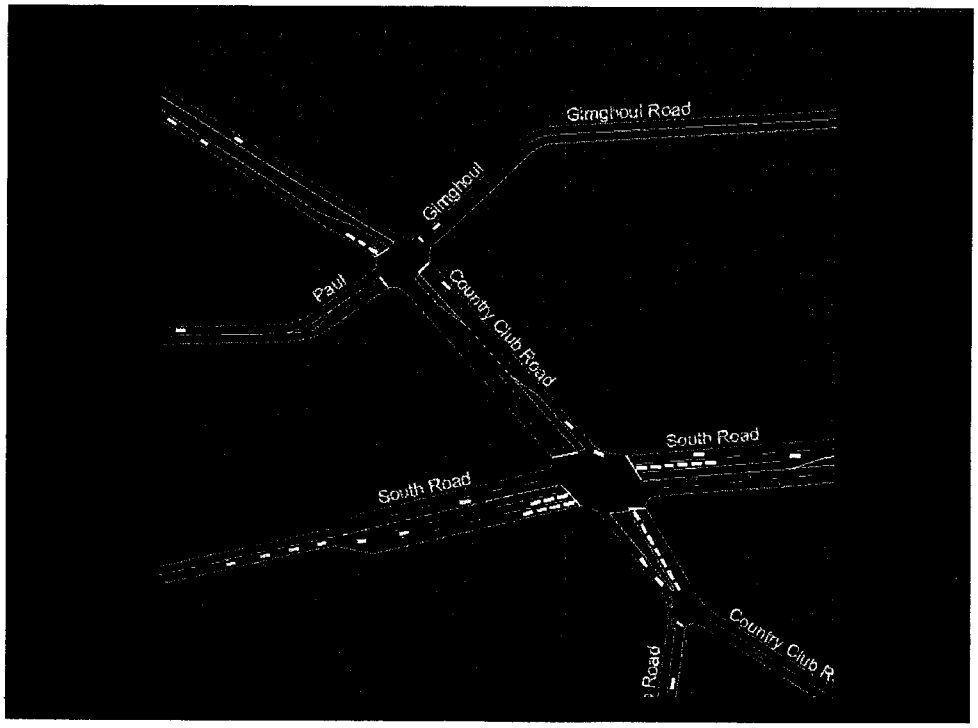
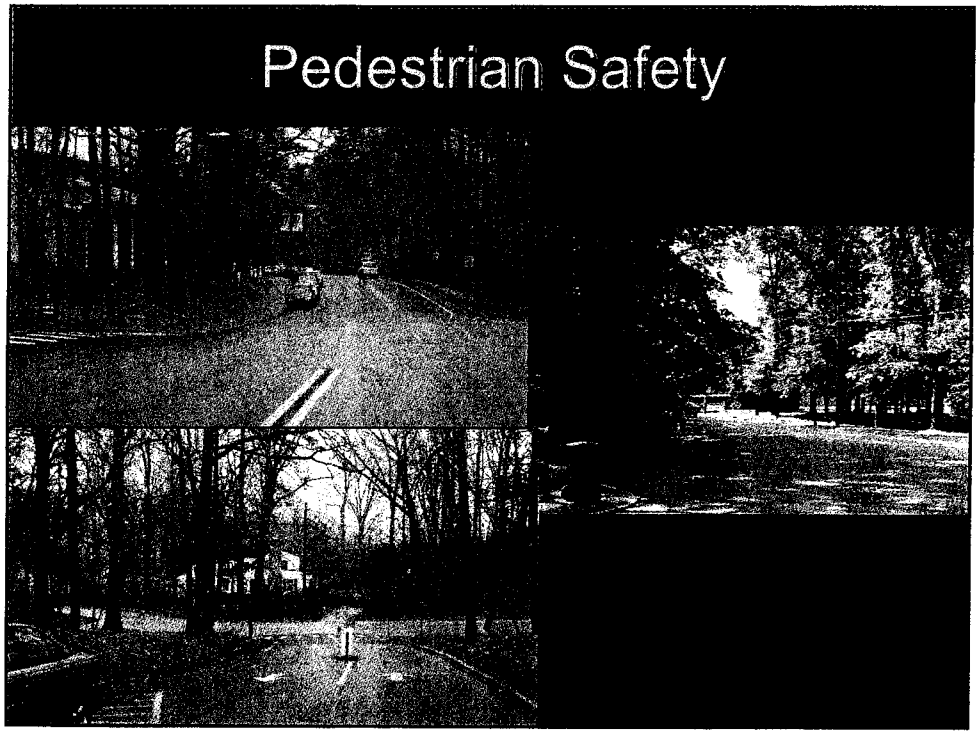
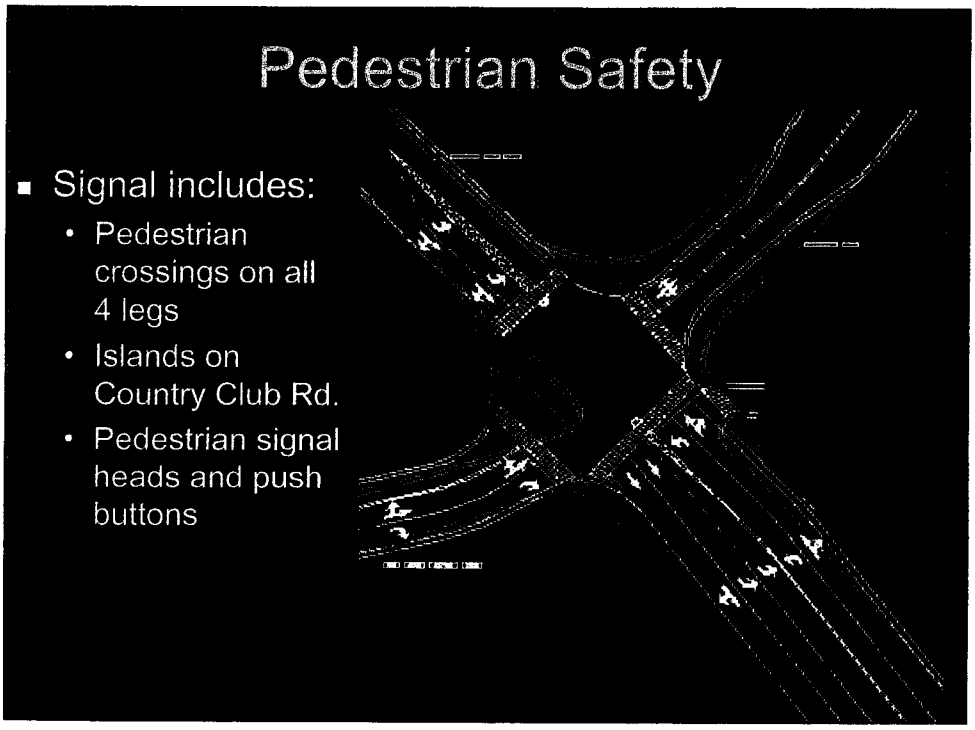
Traffic Signal

- Additional left turn lane at South Rd.
- Minor widening along Country Club to provide:
  - Long northbound left turn lane into PGT Dr.
  - Median at South Rd.
  - Extension of northbound bike lane
  - Sidewalk on east side



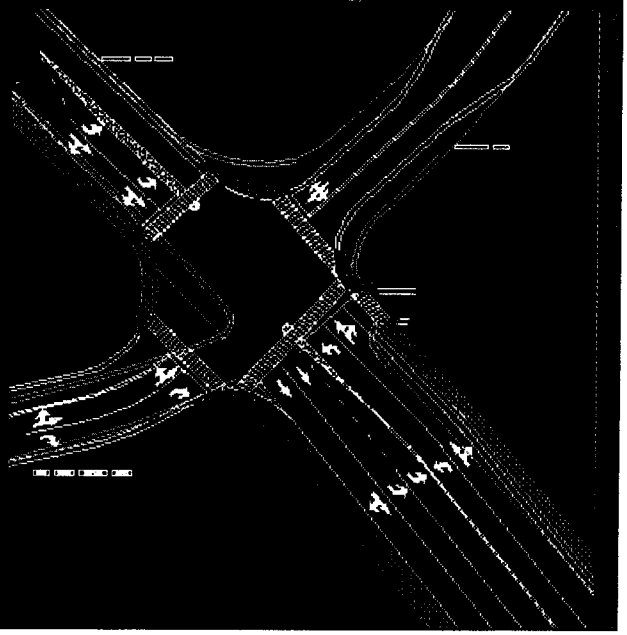



Pedestrian Safety


Pedestrian Safety
Signal includes:
Pedestrian crossings on all 4 legs
Islands on Country Club Rd.
Pedestrian signal heads and push buttons

Pedestrian Safety

- Research shows signal improves pedestrian safety (improves current conditions)
- Potential to add sidewalk on east side of Country Club Rd. between South and Gimghoul Rds.



Summary

- Signal with crosswalks and islands improves pedestrian safety
- Signal improves safety for traffic exiting Gimghoul Rd. and PGT Dr.
- Bike lane and sidewalk can be added on east side of Country Club Rd.
- Reversible lane on South Rd. reduces traffic on Country Club Rd.

Transportation

Transportation Strategy

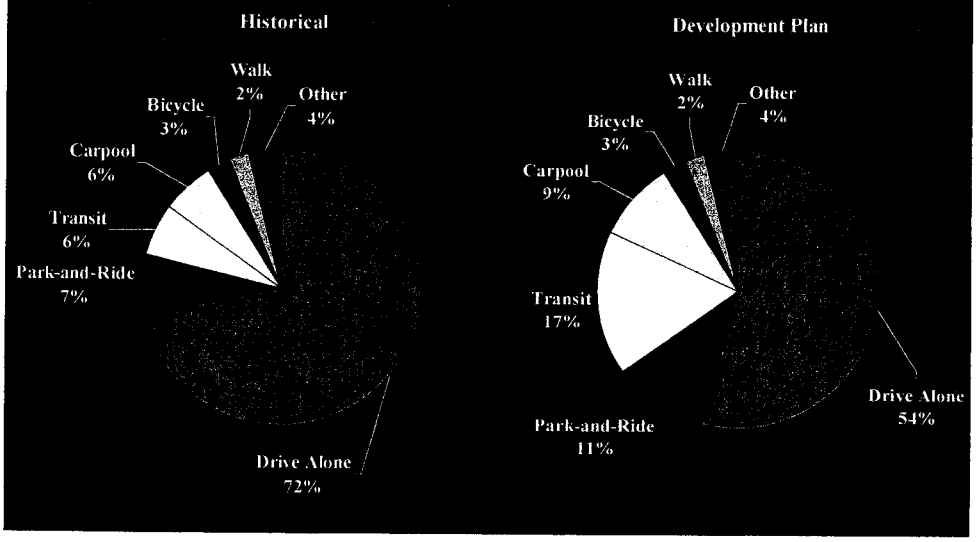
Reduce on-campus parking demand, increase use of alternative modes

- Increased on-campus housing
- Increased park-and-ride
- Increased transit (local and regional)
- Increased carpooling/ridesharing
- Improved bicycle access
- Improved pedestrian access

Meet increased visitor/patient demand

Mode Split Changes

Historic versus Development Plan
Employee



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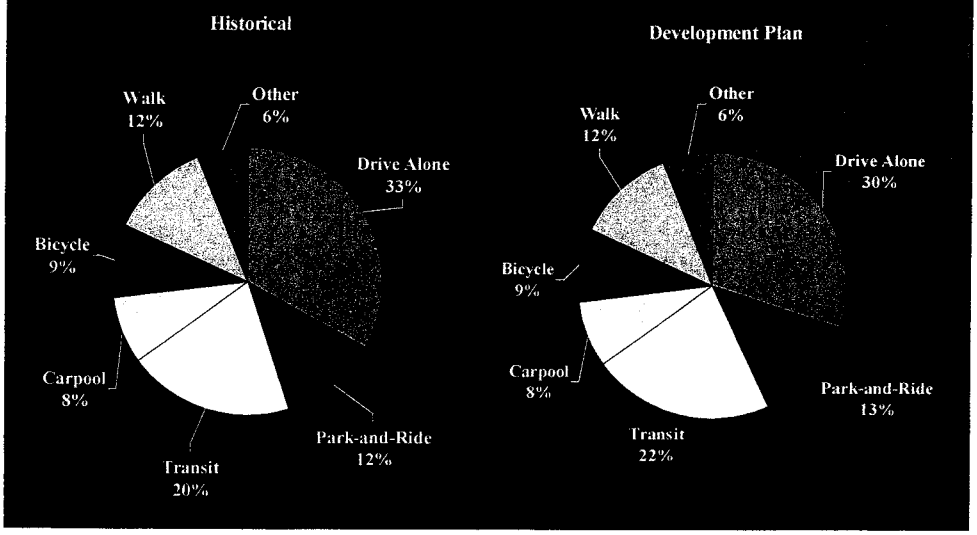
Historic versus Development Plan
Student



Main Campus Parking

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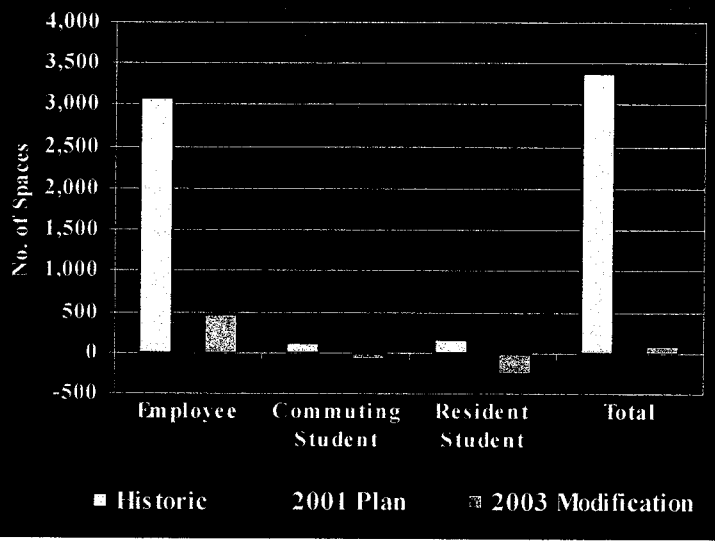
Historic Ratios versus Development Plan



2001 Plan versus 2003 Modification

	2001	2003
Employee	435	454
Comm Student	2	(88)
Res Student	(208)	(263)
Service	(40)	21
Patient/Visitor	1,361	1,455
Total	1,550	1,579

(F-16)

Progress to Date

Progress to Date

On-Campus Housing

- Development Plan
  - 1,000 undergraduate apartment beds
  - 306 student family housing units
- Present Status
  - 960 traditional undergraduate beds completed
  - 933 undergraduate apartment beds in design
  - 600 off-campus storage parking spaces built
  - 37% increase in beds during Development Plan
  - 397 student family housing units in 2004

(1-17)

Progress to Date

Commuter Alternatives Program

- Full Time TDM Coordinator
- Incentives for alternative mode use
  - Merchant discounts
  - Emergency rideback program
  - 10 on-campus permits per year
- 1,879 first-year members (250% of goal)
- 554 had on-campus permits last year

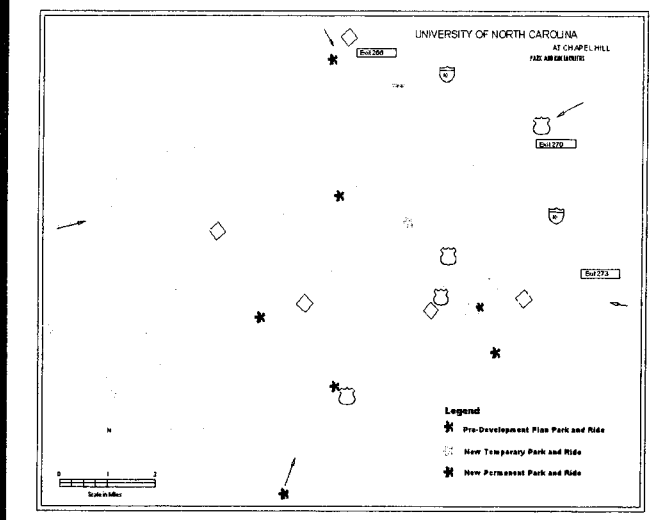
Progress to Date

Park-and-Ride

- Development Plan
  - 1,255 new permanent spaces
  - 2,600 new total spaces
- Present Status
  - 1,306 permanent added; 500 permanent in design
  - 67 temporary spaces added

(1-18)

Progress to Date



Progress to Date

Transit

- Development Plan
  - Add 1,500 CHT riders
  - Add 250 TTA
- Present Status
  - University and students advocated fare free transit
  - 42% increase in CHT transit ridership
  - On- board survey Fall 2003
  - Added new university routes, new peak hour express routes
  - 2003-04 payment to CHT = $4.5 million
  - CHT and TTA on University's Advisory Committee

(1-19)

Progress to Date

Pedestrian Access

- Development Plan
  - Improve pedestrian access and safety
  - 270 commuters walk to work/school
- Present Status
  - Pedestrian Safety Committee
  - Pedestrian Safety Hotline
  - New sidewalk design requirements
  - More sidewalks and signal heads in future years

Progress to Date

Bicycling

- Development Plan
  - Improve bicycle access and amenities
  - 284 commuters bike to work/school
- Present Status
  - Bike lockers under construction in Rams Head

(I-20)

Progress to Date

Carpool/Rideshare

- Development Plan
  - 809 commuters carpool or rideshare
- Present Status
  - On-line carpool and rideshare matching
  - Joint programs with TTA to promote vanpools and ridesharing

Progress to Date

Main Campus Parking

- Development Plan
  - Original plan – 8 decks; 5,330 spaces
  - Modification – 9 decks, 5,290 spaces
- Present Status
  - Rams Head deck under construction, 700 spaces
  - Global Education, Arts Common, and Cobb decks in design

(7-21)

Parking Changes to Date

Development Plan	Other Construction
Permanent	Permanent
Temporary	Temporary

Permanent Permit Losses	
Dev. Plan	400
Other	227
Total	627
Temporary Permit Losses	
Dev. Plan	391
Other	99
Total	490

Revised Deck Plan

Revised Deck Plan

Why delete the Manning Deck?

- Not feasible without new southern entrance
- Requires use of transit from lot to work location; viewed as pay park-and-ride
- Proximate parking is a serious retention/recruitment issue
- Does not address north campus losses

Revised Deck Plan

Why add the Cobb Deck?

- North campus parking below 54% now
- Venable Deck smaller than planned
- School of Government Deck dedicated to its continuing education students
- Night visitor parking needed in closer proximity to Playmakers Theatre
- Symbiotic relationship with chiller
- Opportunity to improve pedestrian friendliness, add green space

T-23

Revised Deck Plan

- 5,290 spaces being added
- Only 1,579 are incremental, remainder are replacement
- Only 103 are for permit holders, remainder are virtually all patient/visitor

Decks replacing existing surface lot permit parking need to be located near losses

Funding Strategy

(1-24)

Funding Strategy

- Parking revenue
  - Sliding scale permit pricing based on income
    - Non-gated = $397, $364, $348
    - Gated/deck = $523, $480, $458
  - Students pay lowest rate
- Transit fees for students and departments
- Charges to capital projects
- Subsidies from Health Affairs departments and the Health Care System

21% of parking revenue supports transit

Chiller Plants and Parking Decks: A Natural Combination

Bradley J. Petterson, P.E. and Jerrold A. Schuett, P.E.

With the recent boom in construction and development on academic, institutional, medical, and research campuses, land for utility systems is becoming more difficult to find. Adjacency relationships among functional requirements on the campus are consolidating development into much smaller areas, leaving less space available for utility systems to be located close to the loads they serve.

To conserve useable land area, a growing trend on campuses is to combine increasing parking needs and chilled water production facilities in a common building. The fact that chiller plants and parking decks are both "utilitarian" facilities appears to make them a natural combination. While it is easy to locate these two facilities adjacent to each other on a common site, it is a bit more challenging to successfully combine their unique functional requirements into one structure.

Affiliated Engineers, Inc. (AEI) was chosen as a consultant in the recent design of three, large campus utility systems that followed this new trend. The first project involved a 2,000-ton chiller plant and a 236-space deck at Williams College (WC) in Williamstown, MA. The second project at the University of North Carolina at Greensboro (UNCG) in Greensboro, NC, included a 6,000-ton chiller plant and a 650-space deck. The third project at Johns Hopkins Hospital (JHH) in Baltimore, involved a 21,000-ton chiller plant and a 2,200-space deck.

Structural Requirements (7-26)

The most common structural system for a chiller plant consists of a steel-framed building, built on a slab-on-grade or a cast-in-place basement with a composite concrete first floor deck. The structural bays are relatively short, with intermediate framing and bracing to carry the heavy loads of the plant equipment and provide locations for pipe and conduit hanger connections.

In contrast, typical parking deck structures are based on "long span" construction. This type of construction is used to reduce the number of interior columns and optimize the design flexibility, functionality, and safety of the deck. Deck structural systems are typically cast-in-place, post-tensioned concrete or precast, pretensioned concrete. While this type of structure is well suited for a deck, it creates several challenges when trying to use it for a chiller plant.

First, the structural beam span is too long to support the larger concentrated loads induced by the plant equipment and piping. Second, the large deflections and movements normally allowed for in the design of deck structures are contrary to the fixed mechanical and electrical connections in a chiller plant. Therefore, it is easiest to separate the chiller plant structure, including any cooling tower platforms or yards, from the main deck structure using expansion joints to isolate the two distinct facilities.

Additionally, the ability to penetrate the post-tensioned or precast concrete systems with the piping required for the plant can require an extensive amount of coordination during design, and results in a system that is less "forgiving" in the future when trying to accommodate changes.

At WC, the plant and deck are located side by side in a common precast structure including a precast roof on the chiller plant space. The single-level plant and tower yard are located on grade starting at the lowest level of parking. In the plant, there is a structural restriction that conduits only 1 in. and smaller can be attached to the precast roof, therefore all major piping and equipment are supported from the slab-on-grade. This makes access and movement through the plant more difficult; however, with good planning the required maintenance access and clearances will be provided.

At UNCG, these issues were addressed by locating a single-level plant on grade below the lowest level of the deck. The towers are located in an enclosed yard on one end of the fourth level of the deck. The main deck structure is precast with cast-in-place columns.

A separate structural steel grid was installed and connected to the deck columns to support all the piping in the plant area so that no connections were made to the deck's precast members. This allowed the large movements of the deck structure to be isolated from the plant equipment and piping. The tower level was also constructed on a portion of the deck structure that was completely separated from the main deck structure by an expansion joint, allowing higher load capacity and a stiffer structure.

At JHH, the plant and deck was constructed with cast-in-place concrete. An expansion joint will separate the plant and the deck facilities. Because of their different needs, the structural grid changes from 30 ft on the deck side to 24 ft on the plant side. Additionally, the cooling towers will be supported by a structural steel frame that connects directly to the deck columns.

Floor-to-floor heights

F-27

The ground level of a typical parking deck will have a floor-to-floor height of approximately 12 ft, 0 in. with a minimum clearance of 9 ft, 0 in. to accommodate accessible vehicle parking requirements, while other levels will have even lower clearances. This does not satisfy the higher height requirements of a plant, which usually ranges from 16 ft to 24 ft to accommodate the installation of the chillers and piping while providing reasonable equipment maintenance clearances. The low clearances in a deck will also restrict vehicle access to the plant.

By simply attaching the plant to the parking deck, it was not a major problem to accommodate the 17 ft clear height provided on the plant area at WC. However, because the primary maintenance access to the plant is through the deck, an exterior areaway has been provided to allow for delivery/removal of the major plant equipment.

A similar approach was used for the plant at JHH, which is a multilevel facility. The basement level, which houses the pump and pipe gallery, has an 18-ft clearance and the first floor chiller level has a 24-ft clear height. Again, the plant starts at the lowest level of the parking deck.

At UNCG, this issue was addressed by taking advantage of the ramping in the deck and the site topography to create a "high bay" clear space under the lowest level of the deck. Another feature of this design is that the plant space was created within the deck footprint with only a minor loss of deck area for usable parking spaces.

Equipment and service access

While all of the required service access to a parking deck can occur through the normal entrance and exit drives, a chiller plant has more specific needs. Provisions for major equipment installation/removal need to be made and are typically done via an overhead door or removable wall panel with grade-level access. In plants with multiple chillers, many times there are a series of doors or wall panels located in direct alignment with the chillers.

The cooling tower area also has specific access needs. Regardless of the type of tower used, there must be crane access to the tower area to allow for delivery and/or construction of the towers and service of major components. If the towers are on an upper level of the deck, a major constraint is that no vehicle taller than 7 ft, 0 in. will be able to access that level because of the low clearances in the deck. Therefore, positioning the towers in a location that is accessible by a crane both now and in the future is very important.

Primary service access to the relatively small equipment at the plant at WC is through interior double doors located on the lowest level of the parking deck and an exterior areaway to allow for delivery/removal of the major plant equipment.

At UNCG, the site topography allowed for grade-level access to the entire plant level from an existing service drive on the backside of the deck, and a series of overhead doors were provided at each chiller. The plant floor level was set at a pickup truck tailgate elevation to simplify the delivery of materials to the plant.

At JHH, the plant is configured with a main service aisle down the middle of the plant that aligns with a large overhead door located at one end. This door and aisle provide for all service and equipment access needs, including chiller tube pull areas, and is directly adjacent to a large loading dock in the parking deck.

Noise emissions

At most institutions, controlling noise emissions from the chiller plant is critical, either because of the plant's proximity to the campus property line or the function of the surrounding facilities. While a deck can have intermittent periods with high levels of noise emissions, the primary concern is the more steady state noise that can be generated by the plant equipment, especially the cooling towers. The equipment inside the plant can be provided with attenuators, sound blankets, motor enclosures, etc., to quiet their operation. The fact that these pieces of equipment are enclosed in the building envelope will also normally contain most objectionable noises. Note that special attention should be given to the building envelope and any opening to make them as sound absorbing and limiting as possible.

Cooling towers have two major sound components: the fans and the falling water. Tower noise can also be generated by the gears and motors on the drive assembly, especially motors that are controlled by VFDs. Several approaches are available for quieting the operation of the towers, the simplest involving the siting of the towers. Elevating the towers and orientating the air inlets so they are directed away from the area to be protected is simple.

Another approach is to construct screen walls around the towers to act as a sound barrier. These walls can also be treated with acoustical absorbing materials to further reduce the noise generated by the towers. If the wall needs to be louvered for airflow, the use of special acoustical louvers installed in an inverted position will reduce noise and direct it upward.

Other approaches for reducing sound levels include the following: special low-speed fans; VFDs on fan motors that allow the fan to run at lower/quieter speeds whenever possible (VFDs also make changes in fan speed less detectable); enclosures to capture the whining sound produced by VFD motors; single-sided inlets instead of double-sided inlets to direct the water noise away from the protected areas; louvers at the tower inlets; basin mats that reduce basin splash noise; and sound attenuators at the tower inlets and/or outlets.

The towers at WC are packaged, counterflow, forced-draft towers that are installed in a large area well adjacent to the parking deck and plant. Because the deck is located directly adjacent to the campus property line that has a 40dBA sound level restriction, the towers have been equipped with inlet and outlet sound attenuators and VFD-controlled fans. The area well walls and tower casings will also be covered with special acoustical materials to absorb noise generated by the towers. Although this solution results in very low noise emissions, it is very energy intensive and will result in higher operating costs.

Both UNCG and JHH feature field-erected counter-flow towers with VFDs. Both projects located the towers on the top of the parking deck behind screen walls with louvers or screen material to allow for airflow on the sides, where noise emissions are not a concern and solid walls on the sides face adjacent property lines and buildings. The towers at UNCG are located within 50 ft of an adjacent high-rise dormitory on one end and within 150 ft of private residences on the other end. By aligning the four-cell cooling tower with the major axis of the dorm and perpendicular to the campus property line, there have been no reports of noise-related complaints.

Cooling tower design issues

Along with noise issues, there are also design and operational issues related to the cooling towers in a combined chiller plant and parking deck facility. In addition to the significant physical area required by the towers, there are visual concerns from the tower appearance, to the fog (plume) that can form when the ambient air is cool, and to the water droplets (drift) of chemically treated water being exhausted from the towers.

To combat these issues there are again several techniques that can be utilized. Similar to the noise control approaches above, one of the simplest options is careful siting of the towers. By locating them on top of the deck or plant, the towers and their occasional plumes are out of "normal" sight lines.

The addition of screen walls can further hide the towers from view, but the design should be carefully reviewed with the cooling tower manufacturer so that they can make modifications to their standard tower selections for actual conditions to avoid recirculation and tower performance issues.

Locating the towers at a higher elevation with adequate "breathing space" allows the drift to disperse from the deck. This provides an opportunity for the water droplets to evaporate before precipitating on adjacent finished surfaces and parked cars.

A quick review of the prevailing winds at the project site should be used to reduce the tower drift concerns by locating the towers such that the normal wind patterns will blow the drift away from the parking deck. High-efficiency drift eliminators should be installed in the tower to minimize drift.

If tower plume is a major concern and the towers cannot be sited where plume is not objectionable, plume abatement systems can be added to the towers. These systems include installing heaters, heating coils, or precipitators in the tower's exhaust air outlet or spraying chemicals in the tower to reduce the moisture level in the airstream before it is exhausted and mixes with the cooler ambient air.

The big disadvantage of these systems is that they are expensive to install and operate for a problem that only occurs only under certain weather conditions. Through careful siting of the towers, plume was not considered to be a major concern on any of the projects completed by AEI.

Finally, one of the planning challenges with the towers is finding adequate space to locate them. Between their physical size and airflow clearances, they require a large footprint area. Generally, the footprint of the cooling towers and "breathing space" is larger than the area required for the chiller plant.

Aesthetics

Because of both structures' physical mass, it can be challenging to disguise a chiller plant and parking deck while simultaneously providing for their functional needs. Many campuses have existing, and sometimes historical, standards for the architecture of new facilities. Combining the two facilities can introduce opportunities for some interesting architectural features and details that may not have existed if the facilities stood on their own, and this may actually allow the chiller plant to be "invisible" to most campus visitors.

Cost accounting and allocation

Since separate campus entities are generally responsible for the parking and utility functions, it is important to develop a system that separately tracks and allocates the costs for each function. Some of the questions to be addressed are:

- What affect, if any (positive or negative), does combining the facilities have on the cost of the space (architecturally and structurally) for each facility? Who pays extra and who receives any savings?
- How are the landscaping and other site improvement costs around the facility divided?
- Who pays for parking stalls that may be lost due to the integration of the plant into the deck?
- How are the costs to extend site utilities to each building divided?

Although the design team generally does not get heavily involved in the actual allocation of costs, there are things it can do to help, such as:

- Provide detailed cost estimates that can be broken down and separated by the various user groups.
- Keep the user groups informed with project progress and details so that they can track their interests and budgets.
- Include bid packages or alternate bids that divide bid costs for portions of the project that may clearly belong to one specific group.

Conclusion

While there are many challenges associated with integrating a chiller plant with a parking deck, there are equally as many opportunities for the design team to exercise their creativity and technical abilities. If this is done carefully and thoughtfully, chiller plants and parking decks can be a natural combination. **ES**

Special thanks to Johns Hopkins Hospital, the University of North Carolina at Greensboro, and Williams College for their permission to feature their projects in this article.

Schuett, a principal with the firm, has been with Affiliated Engineers for 24 years. He is a graduate of the Milwaukee School of Engineering, where he earned a Bachelor of Science degree in architecture and building construction engineering technology. His e-mail address is Jerrold A. Schuett, P.E.

Petterson, a principal with the firm, has been with Affiliated Engineers for 14 years. He is also a graduate of the Milwaukee School of Engineering, where he earned a Bachelor of Science degree in architectural engineering. His e-mail address is Bradley J. Petterson, P.E..

(I-31)

References to Information in UNC Utility Study

"Energy Systems – Infrastructure Improvements" - December 2, 2002

Demand for Chilled Water:

2001	22,800 tons	*pp. VIII, 3-6*
2006	38,454 tons	*p. IX*
2011	40,385 tons	*p. IX*
Ultimate*	50,765 tons	*p. IX*

(Note: To accommodate 50,765 tons of demand, will need 54,175 tons of capacity - *p. XXI*)

Capacity to Produce Chilled Water

2001 — 33,325 tons (maximum, with upgrades, 39,700 tons) – *pp. VI, VII, & 1-3*

Upgrades**: (Can add 2,600 tons with replacement of old existing chillers) – *p. 4-4*
(Can add 2,500 with new chillers in East Plant) – *p. 4-4*

New Plants: Can add 6,000 with new Cobb Chiller Plant – *p. 4-4*
Can add 4,000 with new TES Plant – *p. 4-4*
Can add 6,000 at new Science Complex – *p. 4-4*

Total, ultimately: 54,425 tons (adding these numbers)

*Note – Different figures for Ultimate Demand:

50,765 tons *(p. IX)*
51,284 tons *(p. X)*
50,175 tons *(p.XXI)*

**Note – Different figures for upgrade capacities for East and North plants:

	Existing	Max Capacity	Potential for Upgrade	
North	11,750 *(p.VI)*	14,500 *(p.VII)*	2,750	*(comparing pp. VI and VII)*
East	2,575 *(p.VI)*	6,200 *(p.VII)*	3,625	*(comparing pp. VI and VII)*
Total	14,325	20,700	**6,375**	

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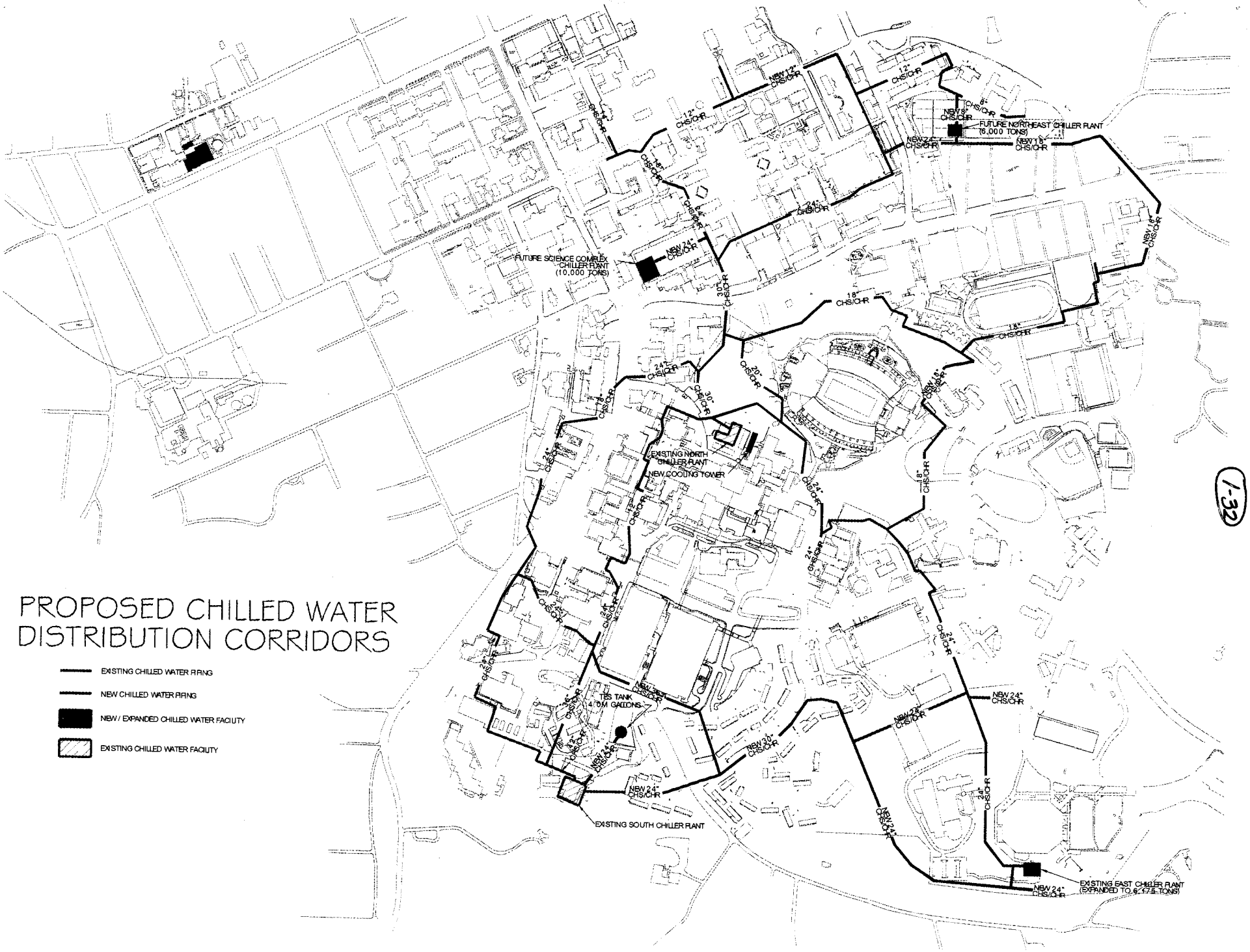
North	11,750 *(p.VI)*	2,000	*(from p. 4-4)*
East	2,575 *(p.VI)*	3,100	*(from p. 4-4)*
Total	14,325	**5,100**	


PROPOSED CHILLED WATER DISTRIBUTION CORRIDORS
EXISTING CHILLED WATER PIPING
NEW CHILLED WATER PIPING
NEW / EXPANDED CHILLED WATER FACILITY
EXISTING CHILLED WATER FACILITY
FUTURE SCIENCE COMPLEX CHILLER PLANT (10,000 TONS)
FUTURE NORTHEAST CHILLER PLANT (6,000 TONS)
EXISTING NORTH CHILLER PLANT
NEW COOLING TOWER
TES TANK 4.7M GALLONS
EXISTING SOUTH CHILLER PLANT
EXISTING EAST CHILLER PLANT (EXPANDED TO 6,175 TONS)

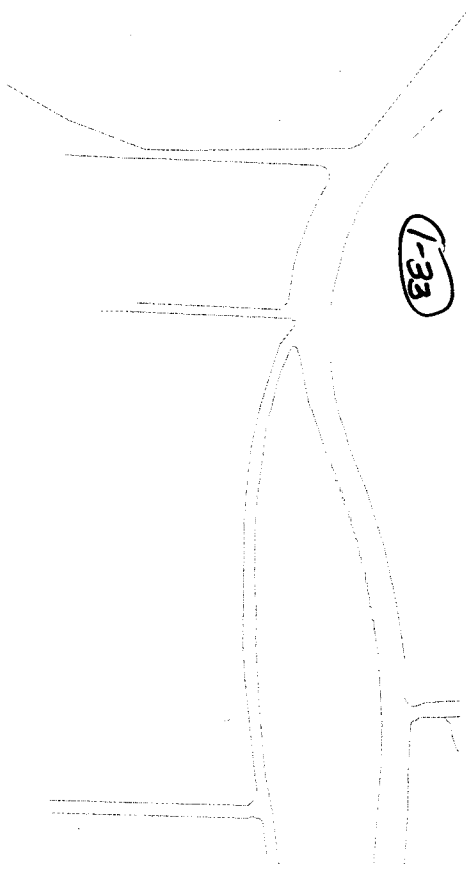
PROPOSED CHILLED WATER DISTRIBUTION CORRIDORS

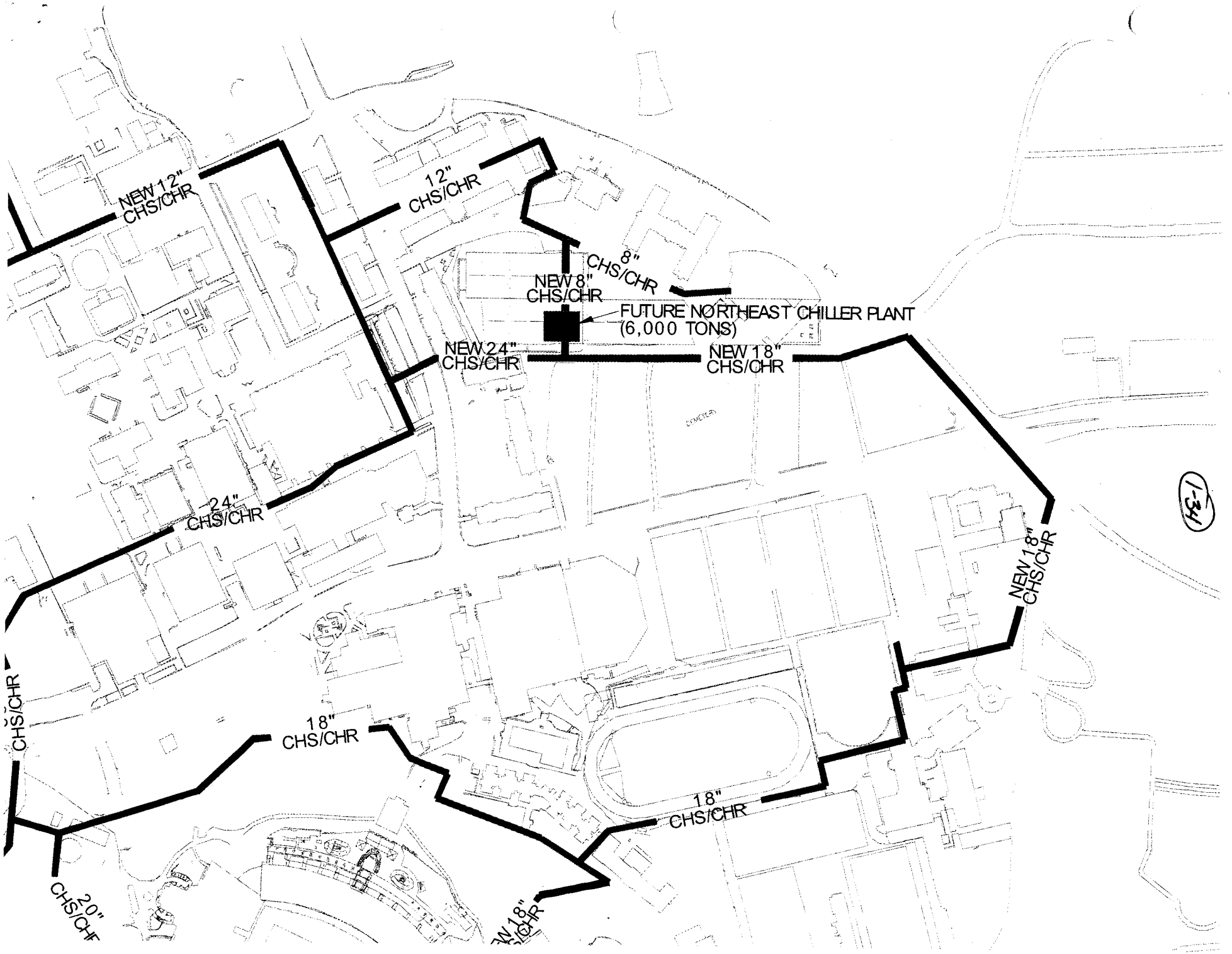
EXISTING CHILLED WATER PIPING

NEW CHILLED WATER PIPING

NEW / EXPANDED CHILLED WATER FACILITY

EXISTING CHILLED WATER FACILITY




NEW 12" CHS/CHR
12" CHS/CHR
8" CHS/CHR
NEW 8" CHS/CHR
FUTURE NORTHEAST CHILLER PLANT (6,000 TONS)
NEW 24" CHS/CHR
NEW 18" CHS/CHR
24" CHS/CHR
I-34
NEW 18" CHS/CHR
CHS/CHR
18" CHS/CHR
18" CHS/CHR
20" CHS/CHR

(1-35)

SUMMARY OF A JOINT TOWN-UNIVERSITY MEETING ON UNC DEVELOPMENT PLANS THURSDAY, JULY 31, 2003 AT 10:00 A.M. KENAN THEATRE, CENTER FOR DRAMATIC ARTS, UNC CAMPUS

Mayor Kevin Foy and UNC Board of Trustees Chair Richard "Stick" Williams called the meeting to order at 10:00 a.m.

Town of Chapel Hill Committee members were Mayor Kevin Foy, Council Member Bill Strom, and Council Member Edith Wiggins. Staff members seated at the table were Town Manager Cal Horton and Town Attorney Ralph Karpinos. Other Council Members present were Mayor pro tem Pat Evans and Council Member Jim Ward. Other Town staff present were Planning Director Roger Waldon, Traffic Engineer Kumar Neppalli, and Town Clerk Joyce Smith.

University Committee members were Board of Trustees Chair Richard Williams, Board of Trustees Member Roger Perry, and Vice Chancellor for Finance and Administration Nancy Suttenfield. Other University staff seated at the table were Associate Vice Chancellor for Campus Services Carolyn Elfland and Associate Vice Chancellor for Facilities Planning and Construction Bruce Runberg. Other University staff present were Chilled Water Services Manager Gary Tompkins, Director of Energy Services Ray DuBose, Special Assistant to the Chancellor for Local Relations Jonathan Howes, and Coordinator of Local Relations Linda Convissor. Members of the University design team present were: George Alexiou of Martin/Alexiou/Bryson, PLLC, Brad Petterson and Jerry Schuett of Affiliated Engineers, Inc., and Rick Warren of Carter/Burgess.

Introduction and Opening Remarks

Mr. Williams opened the meeting by having the participants introduce themselves. He welcomed all in attendance and gave a brief outline of today's agenda.

Mayor Foy provided a brief description of the development issues now facing the Town and University. He emphasized that although the development issues currently under discussion were part of the University's Master Plan, which was a 40 to 50 year plan, the Council did not approve the Master Plan. However, Mayor Foy added, the Council did approve the Development Plan, which is an 8 to 10 year plan.

Mayor Foy noted that the role of this Committee was to gather information regarding the modifications to the approved Development Plan being requested by the University, and to share that information with the Town Council. He noted that the Council's concerns included traffic, noise, and light impacts on surrounding neighborhoods.

Mr. Williams stated that those concerns are the University's concerns as well, and that the University would strive to mitigate the impacts on surrounding neighborhoods as much as possible.

(1-36)

Presentation of Cobb Deck and Northeast Chiller Project

Bruce Runberg offered a Powerpoint presentation on the planned Cobb Deck and chiller plant for the area behind Cobb Hall, the Center for Dramatic Arts, and the Old Chapel Hill Cemetery. (Refer to Attachment 1 for complete slide presentation.)

Regarding the design, Mr. Runberg emphasized the following:

- The site currently consists of about 370 parking spaces and 11 tennis courts.
- The new design for the Cobb Deck will include 550 parking spaces for a net gain of about 180 spaces after the existing surface parking is removed.
- A 10,000 ton capacity chiller plan will be incorporated into the design of the deck.
- By integrating the chiller into the deck, the mechanical elements can be hidden and noise mitigated.
- The parking deck will provide parking for staff, faculty, visitors, and for after-hours events including nearby athletic events.
- The chiller plan will supply chilled water for buildings in the northeast part of campus.
- The deck facade will be brick with precast stone accents.
- The façade will be designed to complement the surrounding buildings and will have louvered and metal grilled openings.
- The parking deck will have five levels of parking with the overall height of the building being consistent with neighboring buildings.
- The chiller area will extend above the northeast corner of the deck but will be shielded from view by dark grey metal panels.
- The existing surface parking and tennis/basketball courts will be removed, and replaced by six new tennis courts and one basketball court.
- The remaining area will be landscaped to provide green plazas and brick walkways.

Regarding the chilled water system, Mr. Runberg stated that in order to provide the amount of chilled water necessary to meet the cooling needs of buildings in the northeast part of campus, much underground piping would be required. He emphasized that the "cooling crisis" is now, and the University must move forward with construction of the chiller plant. Mr. Runberg noted that the Master Plan contains plans for a deck and chiller plant in the Cobb area, adding that the Master Plan is a public document and available for study.

Mr. Runberg stated that the chiller plant was designed to meet the Town's Noise Ordinance standards of 55 dB at the property boundary. He concluded by saying that the completion of the chiller plant was scheduled for the spring/summer of 2006.

Discussion

Referring to one of the slides, Mayor Foy stated that it appeared that the chiller in the planned science complex would be near capacity in 2004. Ms. Elfland stated that slide was referring to the Cobb chiller.

Mayor Foy asked why the science complex chiller was scheduled for later construction. Mr. Runberg answered that the science complex was planned to be constructed in two phases, and cannot begin until 2005 because it is tied to the demolition of the Venable building. He noted that the science complex chiller was scheduled to come on line in 2007. Mr. Runberg said it was not possible to bring it on line earlier because the location of the science complex chiller is where Venable Hall currently stands.

Mayor Foy stated that north campus is now chilled using southern chillers, and asked why it was critical to have a northern chiller plant. Mr. DuBose responded that there was currently an 8,000 ton demand on north campus. He said that was expected to rise to 12,000 tons in three years with the addition of dormitories. Mr. DuBose stated it makes more sense to add a chiller plant on the northern campus now. Gary Tompkins added that the added capacity in south campus was needed in south campus.

Using material previously provided by the University, Council Member Strom noted that the figures on pages VI and VII indicate that the current capacity of chilled water is 33,000 tons, with a maximum capacity of 39,000. Referring to page 4.2, he said that at the end of ten years a capacity of 40,000 tons was needed. On page 4.4, Council Member Strom continued, the materials note that phased installation of additional capacity would result in a gain of 2,600 tons through efficiency, a gain of 2,500 tons through east plant expansion, and a gain of 4,000 through Thermal Energy Storage (TES). Council Member Strom said this leads him to conclude that with a current 33,000 ton capacity plus the additional 9,000 tons without adding the Cobb chiller, an additional chiller plant is not critical.

Referring to the peak chart on page 3.6 of the previous materials, Mr. DuBose noted that the University experiences peak demand in July. He said that it is difficult to phase requirements for upgrades, and noted that TES is not capacity.

Council Member Strom asked what is the difference between peak load and average daily load. Mr. DuBose responded that the peak load, usually experienced in July, was the most the system was expected to provide on a given day, and the average daily load was the base load expected to be provided daily.

Mr. Williams asked if the justification for the Cobb chiller was based on base load or peak load?

Mayor Foy asked if the Cobb chiller was not built, would the deck be built? Ms. Elfland responded that by the end of the development plan period, both the Cobb chiller plant and the science complex chiller plant were needed, as well as the deck.

Mr. Runberg noted that some residence halls were used in the summer, so it was necessary to provide chilled water. He suggested that Council Member Strom meet with University staff to discuss the technical questions he had posed regarding the chiller plant.

Mr. Williams requested a schematic that shows demand, base load, peak load, and timing of facilities coming off-line and those coming on-line.

Council Member Wiggins asked what was being done to mitigate noise produced by the chiller plant. Mr. Runberg responded that the plant would meet the standards of the Town's noise ordinance. Mr. Schuett stated the goal was to exceed the standards wherever possible.

Mr. Perry encouraged a technical meeting with University staff and Council Member Strom to address his concerns. Council Member Strom responded that he did not think it would be appropriate for one Council member to be the one to say "yes" to these development plans without these questions being answered.

Mayor Foy announced that the Committee would be making a bus trip to UNC-Greensboro on Wednesday, August 7, to tour its chiller and parking facilities. He noted that the bus would leave Town Hall at 12 noon, and there would be limited space for members of the media and public who were interested in the tour.

Presentation of University's Transportation Strategy and Implementation Progress

Carolyn Elfland offered a Powerpoint presentation describing the University's transportation strategy and implementation progress, noting their goal was to reduce the on-campus parking demand and increase alternative modes of transportation. (See Attachment 2 for complete slide presentation.)

Ms. Elfland noted that the 2001 plan called for an increase of about 250 parking spaces in the Cobb area, but the 2003 modification indicates an increase of 103 spaces. She stated that the additional parking is provided to accommodate growth in the numbers of faculty, staff, and students on campus. Ms. Elfland concluded by emphasizing the University's efforts to promote alternative transportation methods.

Proposed Traffic Mitigation Measures

Mr. Williams noted that George Alexiou was next on the agenda, but indicated that time needed to be reserved for public comment. Mr. Alexiou stated he could give his presentation in 10 minutes.

Council Member Strom stated that he wanted time to study Ms. Elfland's slides, and suggested they hear a brief overview from Mr. Alexiou then reserve the remaining time for citizen comments. Mr. Perry agreed with Council Member Strom's suggestion. There were no objections.

Using Powerpoint slides, Mr. Alexiou presented an overview of the proposed traffic mitigation measures being considered by the University. (See Attachment 3 for complete slide presentation.) He emphasized slides depicting pedestrian movements and safety.

Council Member Strom said there were three lanes at the Raleigh Road/Country Club Road intersection now, and asked what was planned. Mr. Alexiou said a left lane could be installed without any widening. But, he added, it would need to be widened about 10 to 15 feet to allow for a bikelane and a sidewalk or median.

Mayor Foy asked about the planned median just past the Paul Green Theatre. Mr. Alexiou said some on-street parking spaces would be lost if that median was to be accommodated.

Mayor Foy asked if any improvements were planned for the intersection of Battle Lane and Country Club Road. Mr. Alexiou stated that improvements had been requested by the Town, and they were looking into that now.

Mr. Williams asked that Mr. Alexiou attend the next scheduled meeting on August 5. Mr. Alexiou agreed to do so.

Comments from Citizens

Joe Capowski asked when would the proposed Jackson Circle deck be discussed. Mayor Foy answered that discussion was planned to occur after the discussion on the Cobb Deck was completed, possibly at the August 5 meeting.

Nancy Whittington stated her concern was the size of the Cobb deck, and asked that discussions focus on the deck and issues affecting the neighborhood and not on aspects of the Master Plan. She said that since it is summer and the students are not in town, we are missing their views. Ms. Whittington suggested that the Mayor delay any vote by the Council until after the students have returned and traffic is again at its peak. She stated that those who live on Gimghoul Road would be very happy to keep logs showing how long it takes them to get out of their neighborhood and into traffic, which should help in the transportation planning process. Ms. Whittington thanked the Committee for its focus on pedestrian safety and traffic.

Mayor Foy said that all information received from citizens is being shared with University officials. Mr. Williams added that UNC administration has been forthright in sharing information as well, and encouraged the public to send their comments to the University.

Council Member Ward asked about clarification on use of the parking decks, such as use planned by visitors and students. He specifically mentioned use during sporting events, asking if there was an expectation that the decks would be for such events as well as staff, patients, and others. In other words, he said, what is the expected allocation of these spaces?

Council Member Strom asked for a "primer" on the amount of students parking on campus. And, he continued, what would I do as a student to find parking? Council Member Strom said he would also like some understanding of the normal growth expected on campus and how it would parallel with the projected growth in enrollment.

Council Member Wiggins asked for additional information regarding plans for the cemetery other than the plantings planned along the roadway. Mr. Runberg documented the various discussions that had taken place regarding the cemetery. He said a suggestion had been made to get a group of interested citizens together with University staff to further discuss this issue. Council Member Wiggins stated that more attention needed to be paid to the potential for

additional foot traffic and how it would be managed. Mr. Runberg agreed, noting that plans now were conceptual.

Ms. Elfland noted that more input from the community was needed as to what should be done to lessen the impact of development on the cemetery.

Council Member Ward said it would be helpful to talk about the proposed Cobb deck in light of other nearby parking, and the safety of pedestrians walking to nearly facilities.

Mayor Foy asked for information about the impervious surface that is changing in the Cobb area. He asked if we should assume that stormwater management is being handled in an environmentally sensitive way. Mayor Foy said it would be useful to know numbers and designs, so that we can understand what the changes would look like.

Mr. Perry asked for further information regarding the chiller so that all can understand why the chiller needs to be built now, and why it needs to be built in the Cobb area.

Mayor Foy and Mr. Williams noted that the next meeting was scheduled for Tuesday, August 5, at 10:00 a.m. in the Chapel Hill Public Library, with a third meeting tentative scheduled for August 14.

Council Member Wiggins asked that consideration be giving to acoustics at the next meeting, as many experienced difficulty hearing today's discussion due to the poor acoustics.

The meeting was adjourned at 12:14 p.m.

NOTE: The meeting location for the Tuesday, August 5 meeting was changed to the Council Chamber at the Chapel Hill Town Hall. The meeting time remains at 10:00 a.m.