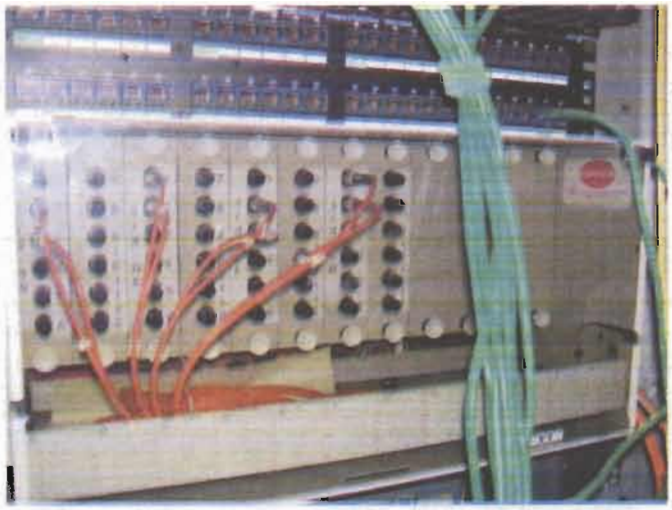
Residence Hall Communication Study

For
State University of New York at Oswego
Oswego, New York



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Fiber Network Upgrade Project
State University of New York at Oswego
Oswego, New York

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EXECUTIVE SUMMARY:

The purpose of this report is to describe the existing data, voice, television, and electrical power distribution systems in several residence halls on the campus and also to suggest methods to upgrade to those systems in order to improve speeds, signal qualities, and convenience power allocations.

Following the description of existing conditions this report suggests two plans of action; rewire and upgrade existing communication transport systems, or contract with a vendor to provide upgrades and services. Asbestos abatement will be required for both plans of action. Refer to Appendix D for the Executive Summary and details of asbestos abatement.

As part of rewiring and upgrading the existing communication transport system, Delta Engineers, P.C. recommends the addition of approximately 1815 data outlets in the buildings included in this report. In addition to the hardware costs for these additional data outlets, the University should budget money for maintenance and repair of these additional outlets. Delta Engineers, P.C. suggests that 5% of the installed outlets will require maintenance during the course of one year. With a maintenance allowance of $100 per outlet, Delta Engineers, P.C. recommends that the University allow approximately $10,000 per year for maintenance of the additional outlets.

If the University decides to rewire and upgrade the exiting transport systems then the following budget costs would apply:

Mackin Dining Hall - $35,118 plus $7,500 for abatement
Funnelle Hall - $238,475 plus $9, 000 for abatement
Cooper Dining Hall - $23,412 plus $10,500 for abatement
Seneca Hall - $314,723 plus $258,000 for abatement
Pathfinder Dining Hall - $23,412 plus $11,250 for abatement
Cayuga Hall - $186,751 plus $243,000 for abatement
Onondaga Hall - $399,685 plus $333,000 for abatement
Littlepage Dining Hall - $23,412 plus $11,250 for abatement
Oneida Hall - $235,580 plus $136,500 for abatement
Scales Hall - $129,437 – no abatement required
Waterbury Hall - $129,437 – no abatement required

PROJECT TOTAL - $1,739,442 plus $1,020,000 abatement = $2,759,442

If the University decides to contract with a vendor to perform the upgrades then the following budget costs would apply:

Base cost for new wiring and upgrades by Time Warner - $339,000
Mackin Dining Hall - $30,000 plus $7,500 for abatement
Funnelle Hall - $157,000 plus $9, 000 for abatement

Cooper Dining Hall - $22,000 plus $10,500 for abatement
Seneca Hall - $202,000 plus $258,000 for abatement
Pathfinder Dining Hall - $22,000 plus $11,250 for abatement
Cayuga Hall - $116,000 plus $243,000 for abatement
Onondaga Hall - $273,000 plus $333,000 for abatement
Littlepage Dining Hall - $22,000 plus $11,250 for abatement
Oneida Hall - $106,000 plus $136,500 for abatement
Scales Hall - $84,000 – no abatement required
Waterbury Hall - $84,000 – no abatement required

PROJECT TOTAL - $1,457,000 plus $1,020,000 abatement = $2,477,000

Both plans of action require that the University provide not only a surface raceway system throughout the residence halls for the upgraded communication wiring but the University must also replace electrical power panels, branch power circuits, and add additional convenience outlets. Because of those required costs and the higher cost of the vendor installation, Delta Engineers, P.C. recommends that the University not contract with a vendor to perform the upgrades to the communications and power systems.

Although the front-end costs of Action Plan #1 exceed the front-end costs of Action Plan #2, the University must consider the large capital investment previously expended for equipment that is already in place. Much of that existing equipment is relatively new and would not require replacement as part of Action Plan #1.

BUILDINGS INCLUDED IN THIS REPORT:

This report includes the respective systems in the following University buildings:

Mackin Dining Hall
Funnelle Hall
Cooper Dining Hall
Seneca Hall
Pathfinder Dining Hall
Cayuga Hall
Onondaga Hall
Littlepage Dining Hall
Oneida Hall
Scales Hall
Waterbury Hall
Lakeside Hall – (Under construction and not part of this report)
Walker Hall - (Under construction and not part of this report)

SITE INVESTIGATIONS:

Delta Engineers visited the site on several occasions. During those visits, Delta Engineers, P.C. met with University personnel in order to determine existing conditions and concerns. In addition, Delta Engineers, P.C. visited the various buildings to investigate the arrangements and conditions of the distribution systems and equipment.

GENERAL BACKBONE ARRANGEMENTS:

General:

Backbones for the systems consist of multi-pair fiber optic cable for data, voice, and television systems. The fiber optic cable system consists of single-mode and multi-mode fibers bundled to provide the distribution network across the campus.

The voice transport backbone also includes some multi-conductor Category 3 copper distribution cables that interconnect adjacent buildings to local circuit switching equipment that is located in one of the adjacent buildings.

The University 13,200 volt power distribution system serves substations in the various University buildings. These substations reduce the incoming voltage to a local utilization voltage of 208/120 volts. The substations also include switching and protective device equipment to serve the lighting and power electrical panels within the respective building.

Fiber Optic Cable Transport system:

In general, the fiber optic cable plant consists of radial cable feeds from one or more central feed points. These feed points are located in Culkin Hall, Snygg Hall, and Lanigan Hall. The three buildings form a triangle on the University for better distribution and reliability. The hub arrangement also permits flexibility in the relocation of resources from one building to another when University needs change. The radial feeds generally consist of a composite of twelve multi-mode fibers and twelve single mode fibers. However, some building feeds consist of twelve multi-mode fibers and twenty-four single mode fibers. The single mode fibers provide the bulk of the communications requirements for the University. The intermixing of single mode and multimode fiber transport systems permits the University to deliver services effectively for both long distances as well as for short distances. The mix also permits redundancy for the transport system.

Several dining halls include wireless communication paths for connection to the data transport system. These wireless connections permit flexibility for students and staff to access the data transport network from locations that do not have multiple hard-wired network connections.

The data transport system attempts to provide 10 mbs from each Residence Hall client jack to the respective network switch that serves that Hall. Switches connect to the fiber optic cable system with a rated speed of 100 mbs. The intermixing of Category 3 cable into the transport system severely limits the overall server to client network speeds.

Fiber optic cable terminations use type SC connectors, however, some of the older installations retain type ST connectors. The University is trying to standardize on type SC connectors.

Original sections of the fiber optic cable plant were installed approximately eight years ago with recent additions to the plant in the summer of 2006.

With the exception of the telephone cabinets that are used for both telephone and data distribution, data termination/switching cabinets have adequate capacity for the present and projected future needs of the system.

Television Distribution System:

The University is served by Time Warner, Inc. through fiber optic cable from the local municipal distribution system. The University maintains the amplifiers, distribution equipment, and the wiring plant that are located on the campus.

Distribution of the television signal is through a single-mode fiber optic cable with conversion to conventional analog signal in each respective building. Some buildings act as local hubs for redistribution of analog signals to close-by adjacent buildings.

Coaxial cables provide the analog signal wiring within the buildings. Horizontal wiring is generally RG-6 and RG-11 type coaxial cable. The cables connect to feed-through style RF jacks in the various building spaces. The feed-through jacks provide a daisy-chained wiring system such that any single jack could cause degradation or loss of signal for down-stream portions of the system.

Delta Engineers, P.C. found that many building spaces had poor signal quality; possibly due to low signal levels, signal reflections within the wiring system, or total loss of signal.

Voice Transport System:

The voice backbone is part of the fiber optic cable distribution system. In general, single mode fibers provide the communication link from the central circuit switches in Onondaga and Waterbury Halls. Local circuit switches located in the various buildings provide the conversion from fiber optic cable to standard Category 3 wiring plants.

Telephone termination and cross connect facilities use TIA 66 style termination and cross-connect wiring equipment. Delta Engineers, P.C. did not find any evidence of VOIP (voice over internet protocol) in the telephone or data transport systems. These termination and cross connect facilities support the multi-conductor copper riser cables that distribute the telephone services to telephone cabinets within the building. Generally there is at least one telephone cabinet on each floor of a building. Horizontal Category 3 wiring extends from these telephone cabinets to the telephone jacks located on the respective floor of the building.

The copper cable distribution was installed at the time of building construction or approximately thirty years ago.

Electrical Power Distribution System:

The University's electrical distribution system provides power at 13,200 volts from the University central substation through below grade cables to unit-substations in the various buildings. Those unit-substations transform the high distribution voltage into standard 208/120 volt utilization voltages.

Electrical unit-substations were installed within the past five years and are in satisfactory condition. Within the various buildings the electrical distribution system, power wiring, and distribution electrical panels are original from the time of building construction. Horizontal wiring from the local electrical panels to the room outlets is also original to the date of building construction.

The residence rooms in many of the buildings are wired such that the outlets of three adjacent rooms are connected to the same single 20 ampere circuit.

In general, the vertical wiring between the service switchboards and the local electrical panels is in satisfactory condition and should be reused.

Security:

There is little physical security of any of the systems described in this report. Telephone terminal closets are often installed in laundry rooms; data cabinets are installed in luggage storage rooms; television distribution equipment is installed in janitor closets; fiber optic cable termination equipment is located in mechanical spaces. Except for the laundry rooms, these spaces include lockable access doors, but due to the general usage of these spaces, the system wiring and equipment is accessible to a large population of students and staff.

BUILDING SYSTEM DESCRIPTIONS:

MACKIN DINING HALL:

The basement of this building contains the termination of a radial feed of twelve multi-mode and twelve single mode fiber optic cables. The cables originate in Snygg Hall. These cables split to provide service to a Nortel Network telephone switch, data distribution switches, and cable television services.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

The telephone switch provides Category 3 service as follows:

25 pair to Building 20
600 pair to Rich hall
400 pair to Sheldon Hall
150 pair for pay phones
The remainder of the service is distributed throughout the Mackin/Lonis complex.

Riser trunk cables from the telephone switch terminate in various janitor/telephone closets located throughout the building complex. The riser cables are landed on standard TIA "66" blocks where the cables are cross-connected to horizontal Category 3 cables that "homerun" from outlets in the residence rooms. The outlets in the residence rooms have been split to provide one RJ-45 jack for data and a second RJ-45 jack for voice.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

The data distribution system utilizes the incoming single mode fiber optic cables to provide signals to the first floor telephone room in Lonis, the second floor data closet in Mackin, and the second floor data closet in Moreland. Signal distribution to these data closets is through multi-mode intra-building trunk cables. Standard multi-port

data switches in the respective closets route the data signals onto standard Category 5 multi-pair riser cables. These riser cables terminate in janitor/telephone closets located throughout the building complex. The riser cables terminate on standard TIA "66" blocks in the closet. Two-pair Category 3 telephone cables extend from these 66 style cross-connect modules to the individual residence hall rooms. Within each room, the pairs of the Category 3 cables split and serve two outlet jacks mounted on a common wall plate. One of these jacks provides voice service to the respective room, the second jack provides the connection to the data transport network.

Riser and horizontal cable distribution systems in Lonis and Moreland are the same as described for Mackin.

Mackin Dining Hall also has wireless data service available. Transceivers located within the hall are hard-wire connected to the second floor data closet in Mackin through Category 5 cables. These cables terminate on standard data switches located in the data closet.

Of special note, there are areas of asbestos cloth insulated wiring within this building. Delta Engineers, P.C. was advised of this condition during design meetings with University personnel, however, Delta Engineers, P.C. has not specifically tested the wiring to confirm this condition.

FUNNELLE HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. One half of these fibers originate from Culkin Hall, the second half of the fibers originate from Lanigan Hall. The fibers terminate in the basement electrical room in a single data closet.

The telephone system consists of a 1200 pair trunk cable that originates in the basement of Cooper Dining Hall. This trunk cable lands on standard TIA "66" blocks in the basement of Funnelle Hall. Two 1200 pair riser cables extend from these cross connection blocks and rise through various janitor/telephone closets located throughout the building.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television

signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

The data distribution system consists of multi-mode fiber optic riser cables that extend from the incoming basement trunk cable to individual data closets located on the second and sixth floors of the building. There are two closets on the second floor and two additional closets on the sixth floor. The second floor closets serve outlets on the first and second floors. The sixth floor closets serve all additional floors in the building. Category 5 multi-pair riser cables extend from these data closets to the janitor/telephone closets located throughout the building. The riser cables land on standard TIA "66" blocks in the Janitor/telephone closets where they are cross connected to the Category 3 horizontal "homerun" cables that terminate on the RJ-45 telephone jacks in the respective residence rooms.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

COOPER DINING HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. One half of these fibers originate from Culkin Hall, the second half of the fibers originate from Langin Hall The fibers terminate in the basement electrical room in a single data closet.

A 1200 pair multi-conductor telephone cable originates at a switch located in Hart Hall and extends to service protector blocks located in the basement electrical room of Cooper Dining Hall. Standard TIA "66" blocks cross connect this trunk cable to Category 3 riser cables that extend to Janitor/telephone closets located throughout the building. Additional pairs extend from these incoming service blocks to Funnelle Hall.

Television service consists of a single coaxial feed cable from Funnelle Hall and terminates in the single television outlet in the first floor fitness center.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local

distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

The Cooper Dining Hall also contains a wireless network connection with transceivers hardwired to the main data closet with Category 5 cable.

SENECA HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Snygg Hall. These cables split to provide service to a Nortel Network telephone switch, data distribution switches, and cable television services.

Riser cables extend from these cross connection blocks and rise through various janitor/telephone closets located throughout the building.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

The data distribution system consists of multi-mode fiber optic riser cables that extend from the incoming basement trunk cable to individual data closets located on the second and sixth floors of the building. There are two closets on the second floor and two additional closets on the sixth floor. The second floor closets serve outlets on the first and second floors. The sixth floor closets serve all additional floors in the building. Category 5 multi-pair riser cables extend from these data closets to the janitor/telephone closets located throughout the building. The riser cables land on standard TIA "66" blocks in the Janitor/telephone closets where they are cross connected to the Category 3 horizontal "homerun" cables that terminate on the RJ-45 telephone jacks in the respective residence rooms.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local

distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

PATHFINDER DINING HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Snygg Hall and split to provide service to data distribution switches, and cable television services.

Telephone service is through multi-conductor trunk cables that originate on a voice switch in Onondaga and terminate on standard TIA "66" blocks in the Pathfinder Dining Hall electrical room.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

Fiber optic cables extend from the incoming service point to a data closet that serves the Pathfinder Dining Hall. This data closet is located in the basement electrical room. A second set of fiber optic cables extend to a separate data closet in the police department area of the building. Wiring within the police department area was installed recently.

The dining hall also contains a wireless network connection with transceivers hardwired to the main data closet with Category 5 cable.

CAYAUGA HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Snygg Hall and split to provide service to a Nortel Network telephone switch, data distribution switches, and cable television services.

Riser cables extend from these cross connection blocks and rise through various janitor/telephone closets located throughout the building.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution

The data distribution system consists of multi-mode fiber optic riser cables that extend from the incoming basement trunk cable to individual data closets located on the second and sixth floors of the building. There are two closets on the second floor and two additional closets on the sixth floor. The second floor closets serve outlets on the first and second floors. The sixth floor closets serve all additional floors in the building. Category 5 multi-pair riser cables extend from these data closets to the Janitor/telephone closets located throughout the building. The riser cables land on standard TIA "66" blocks in the janitor/telephone closets where they are cross connected to the Category 3 horizontal "homerun" cables that terminate on the RJ-45 telephone jacks in the respective residence rooms.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

ONONDAGA HALL:

A fiber optic cable that consists of twelve multi-mode fibers and forty-eight single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Lanigan Hall and split to provide service to a Nortel Network telephone switch, data distribution switches, and cable television services.

Riser cables extend from these cross connection blocks and rise through various janitor/telephone closets located throughout the building.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution

The data distribution system consists of multi-mode fiber optic riser cables that extend from the incoming basement trunk cable to individual data closets located on the second and sixth floors of the building. There are two closets on the second floor and two additional closets on the sixth floor. The second floor closets serve outlets on the first and second floors. The sixth floor closets serve all additional floors in the building. Category 5 multi-pair riser cables extend from these data closets to the Janitor/telephone closets located throughout the building. The riser cables land on standard TIA "66" blocks in the Janitor/telephone closets where they are cross connected to the Category 3 horizontal "homerun" cables that terminate on the RJ-45 telephone jacks in the respective residence rooms.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

LITTLEPAGE DINING HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Snygg Hall. These cables split to provide service to data distribution switches, and cable television services.

Telephone service is through multi-conductor trunk cables that originate on a voice switch in Onondaga and terminate on standard TIA "66" blocks in the Littlepage Dining Hall electrical room.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the

"feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

Fiber optic cables extend from the incoming service point to a data closet that serves the Littlepage Dining Hall. This data closet is located in the basement electrical room. A second set of fiber optic cables extend to a separate data closet in the police department area of the building. Wiring within the police department area was installed recently.

The dining hall also contains a wireless network connection with transceivers hardwired to the main data closet with Category 5 cable.

This dining hall is the same as described for Pathfinder Dining Hall with the exception that there is no separate data closet for the police department. Instead, there is additional data wiring for the fitness center. That wiring was recently installed.

ONEIDA HALL:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Onondaga Hall. These cables split to provide service to a Nortel Network telephone switch, data distribution switches, and cable television services.

Riser cables extend from these cross connection blocks and rise through various janitor/telephone closets located throughout the building.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

The data distribution system consists of multi-mode fiber optic riser cables that extend from the incoming basement trunk cable to four data closets. Three of these closets are located on the third floor and one closet is located on the first floor of the building. Category 5 multi-pair riser cables extend from these data closets to the

Janitor/telephone closets located throughout the building. The riser cables land on standard TIA "66" blocks in the Janitor/telephone closets where they are cross connected to the Category 3 horizontal "homerun" cables that terminate on the RJ-45 telephone jacks in the respective residence rooms.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

WATERBURY AND SCALES HALLS:

A fiber optic cable that consists of twelve multi-mode fibers and twelve single mode fibers serve this building. The fibers terminate in the basement electrical room in a single data closet. The cables originate in Onondaga Hall. These cables split to provide service to a Nortel Network telephone switch, data distribution switches, and cable television services. There is one data closet in the basement electrical room.

Riser voice cables extend from these cross connection blocks and rise through various janitor/telephone closets located throughout the building.

The television distribution system utilizes two of the incoming fiber optic cables for conversion to standard coaxial cable. Signal conversion occurs in the basement electrical room. The coaxial cables are routed throughout the building providing television signals to outlets in residence rooms and other selected spaces. Generally the wall outlets located in the residence rooms are of the "feed-through" type and provide a "daisy-chain" arrangement for signal distribution.

The voice telephone switch in Waterbury provides multi-conductor copper riser cables that serve Johnson, Lakeside, Riggs, Scales, and Walker Halls.

A unit-substation converts the incoming 13,200 volt power to 208/120 volt utilization voltage for final distribution to local distribution electrical panels. The local distribution electrical panels are located on various floors throughout the building.

LAKESIDE HALL:

This hall is presently under construction. Delta Engineers, P.C. did not investigate this building or the respective services.

WALKER HALL:

This hall was recently renovated. Delta Engineers, P.C. did not investigate this building or the respective services.

University personnel provided the following information for this building:

All data jacks were replaced and have new Category 5 horizontal cables from the respective jack to the basement data closet.

All voice jacks were replaced and have new Category 5 horizontal cables from the respective jack to standard TIA "66" blocks in the basement.

The fiber trunk cable to the building consists of twenty-four multi-mode fibers and twenty-four single mode fibers. These fibers originate in Lee hall.

The television system is similar to Mackin Dining Hall with the exception that each television outlet has a "homerun" coaxial cable from the respective jack to a basement distribution splitter/tap system.

COURSES of ACTION to UPGRADE the EXISTING COMMUNICATION and POWER SYSTEMS:

General Description:

In order to upgrade the existing communication systems, Delta Engineers suggests that the University has the opportunity to pursue either of two plans of action.

Action Plan Number One requires the University to replace obsolete cable and wire technologies with cables and wire designed for the transport speeds and quality of signals expected in today's academic environment.

Action Plan Number Two requires the University to contract with a private vendor in order to provide data and television services to the residence halls. At the suggestion of the University, Delta Engineers, P.C. requested

the current utility carrier, Time Warner Cable Business Class (hereinafter referenced as Time Warner), to provide a strategy for this type of plan. Simply stated, in this action plan Time Warner would replace the existing television distribution cable system with a fully digital cable system that would provide a single transport system for television, data, and digital voice communication. This report contains a more detailed description of Time Warner's strategy in the following sections.

Either action plan would retain the existing voice transport system to support student analog phone services. However, only Action Plan Number Two would permit digital phone services on an individual student basis.

Although either action plan would upgrade the communication systems in the residence halls, the University must also upgrade the electrical distribution panels and branch circuits in each residence hall in order to provide power for the student equipment that accesses the communication systems.

Both action plans include provisions for abatement of asbestos. The University must consider the costs for abatement as part of either plan.

Action Plan Number One:

General Recommendations:

Inter-building Fiber Optic Cable Systems:

In the opinion of Delta Engineers, P.C. the current implementation of the data, voice, and television fiber optic cable transport systems that interconnect the main campus residence hall buildings is adequate for present and projected future needs. However, currently there is no high-capacity pathway to the south side of the University. Because of the lack of that pathway Delta Engineers, P.C. recommends that the University plan an extension of the fiber optic cable transport system to serve that portion of the University. Design and cost recommendations for that extension are not in the scope of this report.

Although Delta Engineers, P.C. does not recommend immediate changes to the existing cable backbone system, any future installations of fiber optic cable should increase the number of single mode fibers from 12 to 18 and reduce the number of multi-mode fibers from 12 to 6. Single mode fibers will better serve the long inter-building distances on the campus

and will maintain the transport speeds necessary for the data, telephony, television, security, and building automation systems. Multi-mode fibers are less effective for these long-distance services but they could support less demanding needs.

Inter-building Cable Termination Facilities:

In general, fiber optic cable termination facilities and data distribution cabinets within each residence hall are adequately sized for the present and projected future needs of the University. Delta Engineers, P.C. does not recommend any changes to the fiber optic cable termination equipment

Except for those buildings that contain analog telephone switching equipment, the telephony services enter the residency hall buildings through multi-conductor copper trunk cables. These cables terminate on service protective equipment and cable distribution blocks within each building. Delta Engineers, P.C. does not recommend any changes to the copper trunk cables or the telephony termination equipment.

Television services enter the residency hall buildings through fiber-optic cable that terminates on digital-to-analog converters. Delta Engineers, P.C. does not recommend any changes to the television termination equipment.

Inter-building Electrical Power Distribution System:

The 13,200 volt services to the various buildings serve low-voltage unit-substations located within the respective buildings. The substations include dry-type transformers that terminate in circuit-breaker style switchboards to provide utilization voltage to the lighting and power panels located throughout the building. The substations and associated switchboards are relatively recent installations and they are adequate for the present and projected future electrical loads. Delta Engineers, P.C. does not recommend any changes to the inter-building power distribution equipment in the residence halls.

Physical System Security Access Control:

The current physical security systems provide a low level of control against unauthorized access because communication equipment is often installed in rooms accessible not only to students but also to the general staff.

Much of the existing access control consists only of locked room doors or locks on equipment cabinets. There is no electronic card access control and/or monitoring. Therefore, with the exception of power distribution equipment, Delta Engineers, P.C. recommends that the University create independent rooms for the communication systems. These rooms should be complete with electronic security devices such as card readers in order to control and log the "who-when-where" access to the various communication systems. To create secure spaces the University may utilize some of the existing locations and simply add electronic security devices. In other locations the University may need to install additional walls and doors in order to create independent and secure spaces.

Horizontal Data Wiring Systems:

Delta Engineers, P.C. recommends that the University replace the existing Category 3 horizontal data transport network wiring that interconnects the local telephone panel with the respective room outlets. This replacement would install new Category 6 wiring from the data equipment cabinets to the respective room outlets. For each residence hall bedroom the new Category 6 wiring system would extend two individual cables from the respective data equipment cabinet to two individual RJ-45 data jacks in each residence hall room. That wiring replacement would also include the removal of the existing Category 5 cabling that interconnects the existing data equipment cabinets with the telephone cabinets.

In addition, Delta Entineers, P.C. recommends the addition of horizontal transport wiring, hardware switching equipment, and data outlets in each residence room in order to provide not less than one data port for each residence bed. In general, this recommendation will double the number of data ports, cables, and outlets in each residence hall.

Residence Hall Television Wiring Systems:

Delta Engineers, P.C. recommends the replacement of all interior television wiring within the respective buildings with a new television signal distribution system. This new wiring system would replace cables, outlets, and appurtenances with a new radial (homerun) cable plant. The new radial television cable plant would provide signal amplifiers and splitter/taps at

the point of entry to the building, vertical wiring to each floor, splitter/taps on each floor, and individual horizontal wires to new outlets in each building space that requires CATV services.

The radial television cable plant would include an incoming signal amplifier that would amplify the converted (fiber optic cable to coaxial cable) television signal to a level that is adequate for serving the cable distribution system within the building. In general, the output signal of that amplifier would serve a series of splitters and/or taps that would serve standard three-eight inch or one-half inch coaxial riser cables to the middle floor of a series of three floors. The risers would terminate on additional splitter and/or tap devices in a dedicated and secure equipment space on the selected floor. These devices would provide "homerun" signal feeds through RJ-11 coaxial cables to the individual outlet jacks in the respective rooms. The "homeruns" would supply the floor above, the floor below, and the floor that contains the distribution equipment. The jacks in the rooms would consist of a standard wall plate and "F" type cable connector. The installation would be designed to provide between 0 (zero) db and not more than plus 10 db signal level at each outlet location.

Residence Hall Telephone Wiring Systems:

Multi-conductor twisted-pair voice riser cables extend from the service point of the building to the individual 66 style cross-connect equipment in the telephone distribution cabinets that are located throughout the building. Delta Engineers, P.C. does not recommend any changes to these vertical riser cables.

In each residence hall bedroom the existing horizontal wiring for the voice system shares one pair of the two-pair Category 3 cable that connects the local telephone distribution closet with the jack in a residence hall room. This wiring is described in the data transport paragraphs of this document. Although the industry standard for modular RJ11 telephone jacks requires a two-pair cable to serve each analog telephone jack, Delta Engineers, P.C. offers the opinion that the existing horizontal Category 3 single-pair cabling system provides adequate telephone service to the residence hall bedrooms. Therefore, Delta Engineers, P.C. does not recommend any changes to the existing horizontal analog telephone wiring.

Residence Hall Power Wiring Systems:

In order to improve the capacity of power available to the individual residence hall rooms, Delta Engineers, P.C. recommends that the University rewire each residence hall room in order to provide not less than four duplex 120 volt, 20 ampere receptacles per residence room. A new single 20 ampere electrical circuit would serve these four receptacles. Because of the age of the existing branch circuit wiring, Delta Engineers, P.C. recommends the removal of the existing branch circuit wiring and convenience outlets in each resident hall room. The new branch circuit wiring would terminate in new electrical power panels locate on each floor of the respective building.

Within each building, vertical feeders extend from the load center switchboard to serve lighting and power panels that are located throughout the respective floors of the building. Although these feeders were installed at the time of the construction of the building, the feeders are satisfactory for reuse. Therefore, Delta Engineer, P.C. does not recommend any changes to the existing vertical feeders with the exception of adjustments that might be necessary for the installation of the respective new branch circuit panels.

Wiring Raceway Systems:

In order to install the new data, television, and power branch circuit wiring, Delta Engineers, P.C recommends the installation of a surface metal raceway system (Wiremold or equal).

The surface raceway systems must separate communication distribution systems from power distribution systems. Therefore, in general, one raceway system will provide communication distribution between data closets and residence hall rooms and a second system will provide distribution between electrical panels and convenience receptacles in residence hall rooms.

Where possible, the two surface raceway systems should run parallel, for example, in corridors and at entrances to residence hall rooms. The exact paths for these raceway systems must be determined during the engineering design phase of the planned upgrades since each corridor, residence hall room,

data closet, and electrical panel will be different in location and connection requirements.

The physical size of the raceway systems are a function of the quantity of cables contained within the respective raceway. As raceways extend from the source (data closet or electrical panel) the size of the raceway will reduce since the quantity of cables will reduce as services "drop off" at residence hall rooms.

Upgrades within the Buildings:

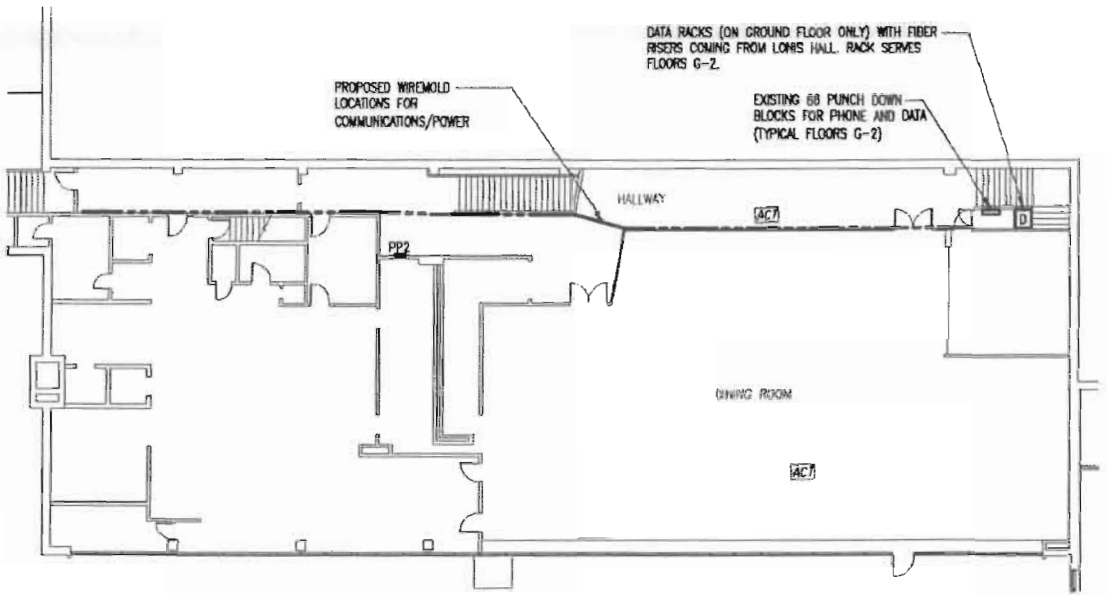
Mackin Hall

The following typical floor plan shows a suggested routing for the surface raceway distribution system in Mackin Hall. The raceway systems will provide connectivity between the data closets on the floor and the individual rooms on the floor using the common corridor as a path.

The raceway provides connectivity between the individual rooms and the electrical panel that serves the convenience outlet on the respective floor.

For security purposes, Delta Engineers, P.C. recommends that a card access be added to the room that contains the existing data racks and voice cable punch down blocks.

Following is a typical floor plan with a suggested raceway layout.



1/E9 TYPICAL MACKIN HALL FLOOR PLAN

SCALE: NONE

NORTH

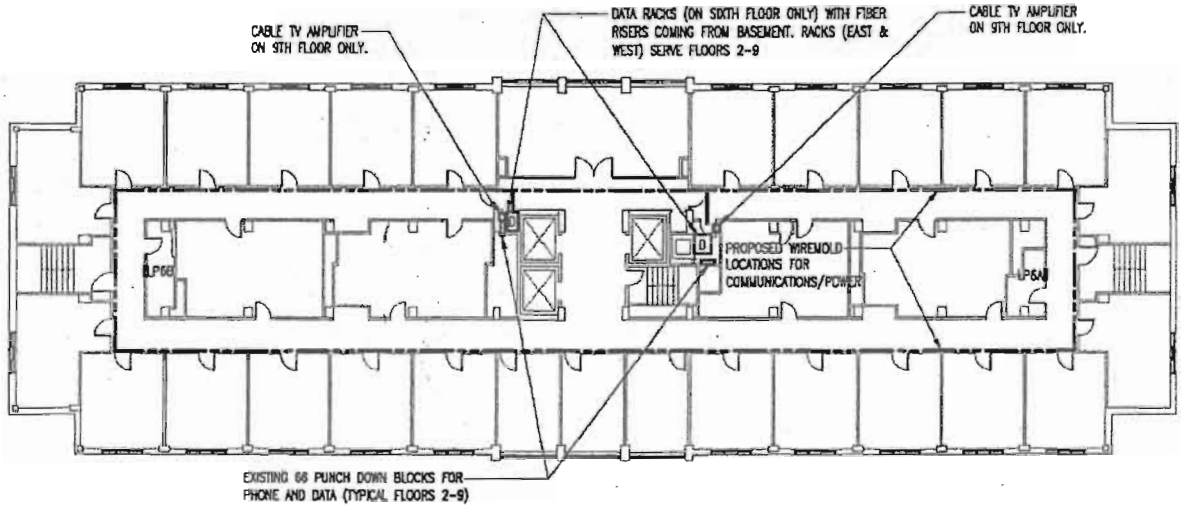
In general, data, power, and communication services are located near the ends of the floor. Therefore, as diagramed on the following floor plan, Delta Engineers, P.C. recommends a loop style raceway distribution system for the typical floors.

Delta Engineers, P.C. recommends the addition of approximately 245 data outlets to this residence hall.

This loop style raceway distribution system will permit interconnection of any room with either of the service location points. Because of the loop arrangement, the raceway system should be uniform in size throughout the loop in order to provide the maximum flexibility for cable distribution.

For security, Delta Engineers, P.C. recommends that the existing rooms that contain the data, TV, and voice equipment be isolated from other non-electrical services through the relocation of those non-electrical services to other areas of the building. A card access system should be added to the existing room that contains the communication equipment.

Following is a typical floor plan with a suggested raceway layout.



1/E3 TYPICAL FUNNELLE HALL FLOOR PLAN

SCALE: NONE

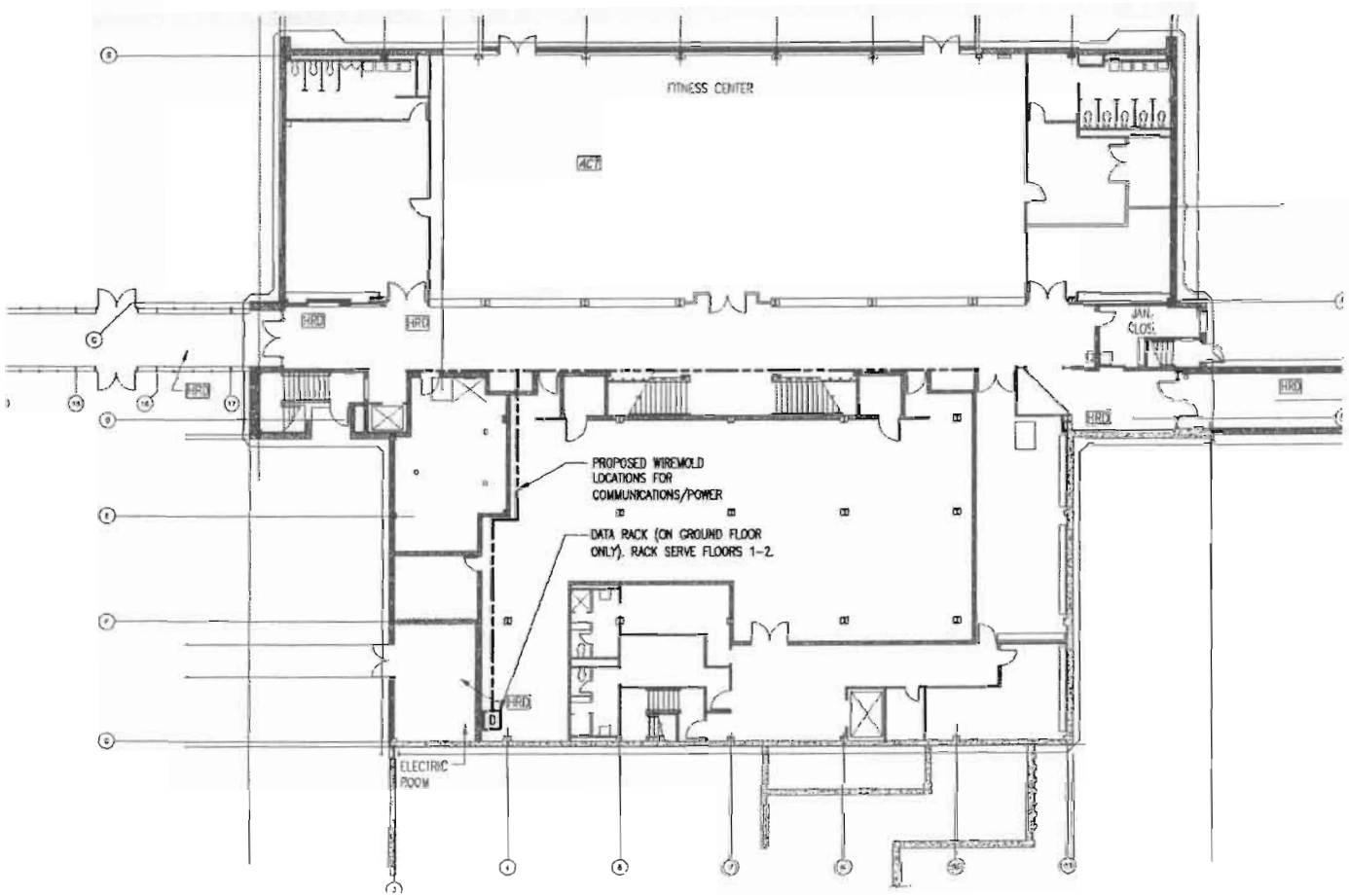
NORTH

Because the service locations are not located adjacent to the central corridor, the raceway systems for this building will form a "Tee" arrangement such that the services are extended to the central corridor prior to distribution along the length of that corridor.

In general, the raceway system between the service location and the corridor should be maximized to permit expansion of the cable networks at a later date. In the corridor, the raceway system will reduce in size in accordance with the cable capacity requirements.

For security, walls and doors should be constructed around the existing communication equipment. The doors to that new room should be protected by a card access system.

Following is a typical floor plan with a suggested raceway layout.



1/E.11 TYPICAL COOPER HALL FLOOR PLAN

SCALE: NONE

NORTH

Seneca Hall

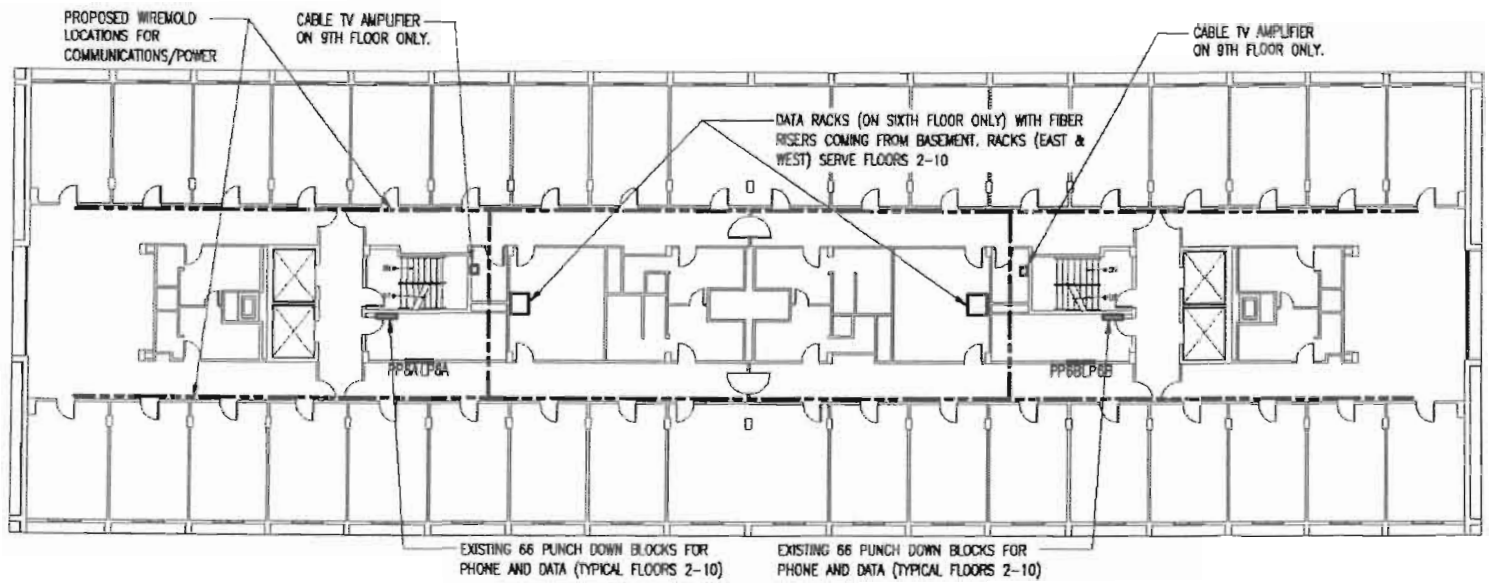
Seneca Hall will require a hybrid type of raceway distribution system such that a loop style system will serve the core of a typical floor but there will be radial extensions from that core loop. The radial extensions will extend the services to the rooms that are located beyond the central core.

Delta Engineers, P.C. recommends the addition of approximately 320 data outlets to this residence hall.

The raceway system that serves the core of the floor should be uniform in cable capacity in order to provide for additions to the communication systems at a future date. The surface raceway systems that form the radial extensions may reduce in size in accordance with cabling needs.

For security, walls should be constructed to isolate the existing data cabinets from the remaining storage areas. Since there are two existing doors that connect the storage areas with the adjacent corridor, possibly the room could be divided into two spaces such that one door continues to serve the storage area while the second door would provide access to the data equipment. The door to the data equipment room should be protected by a card access system. In addition, the existing telephone distribution panels are located in laundry rooms. Delta Engineers, P.C. recommends that the panel covers be replaced with more secure covers and locking mechanisms.

Following is a typical floor plan with a suggested raceway layout.



1/E1 TYPICAL SENECA HALL FLOOR PLAN

SCALE: NONE

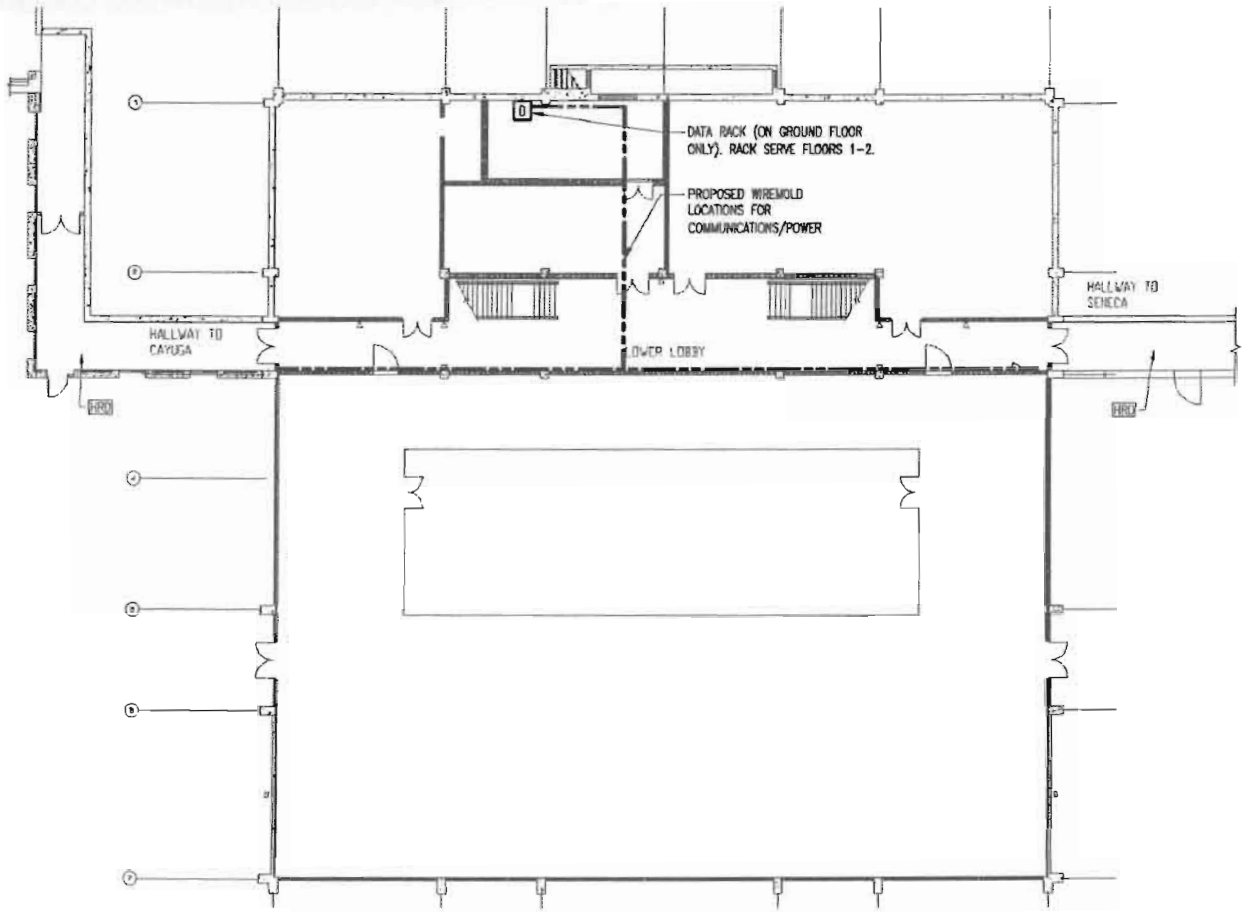
NORTH

Because the service locations are not located adjacent to the central corridor, the raceway systems for this building will form a "Tee" arrangement such that the services are extended to the central corridor prior to distribution along the length of that corridor.

In general, the raceway system between the service location and the corridor should be maximized to permit expansion of the cable networks at a later date. In the corridor, the raceway system will reduce in size in accordance with the cable capacity requirements.

For security, walls and doors should be constructed around the existing communication equipment. The doors to that new room should be protected by a card access system.

Following is a typical floor plan with a suggested raceway layout.



1 / E12 TYPICAL PATHFINDER HALL FLOOR PLAN

SCALE: NONE

NORTH

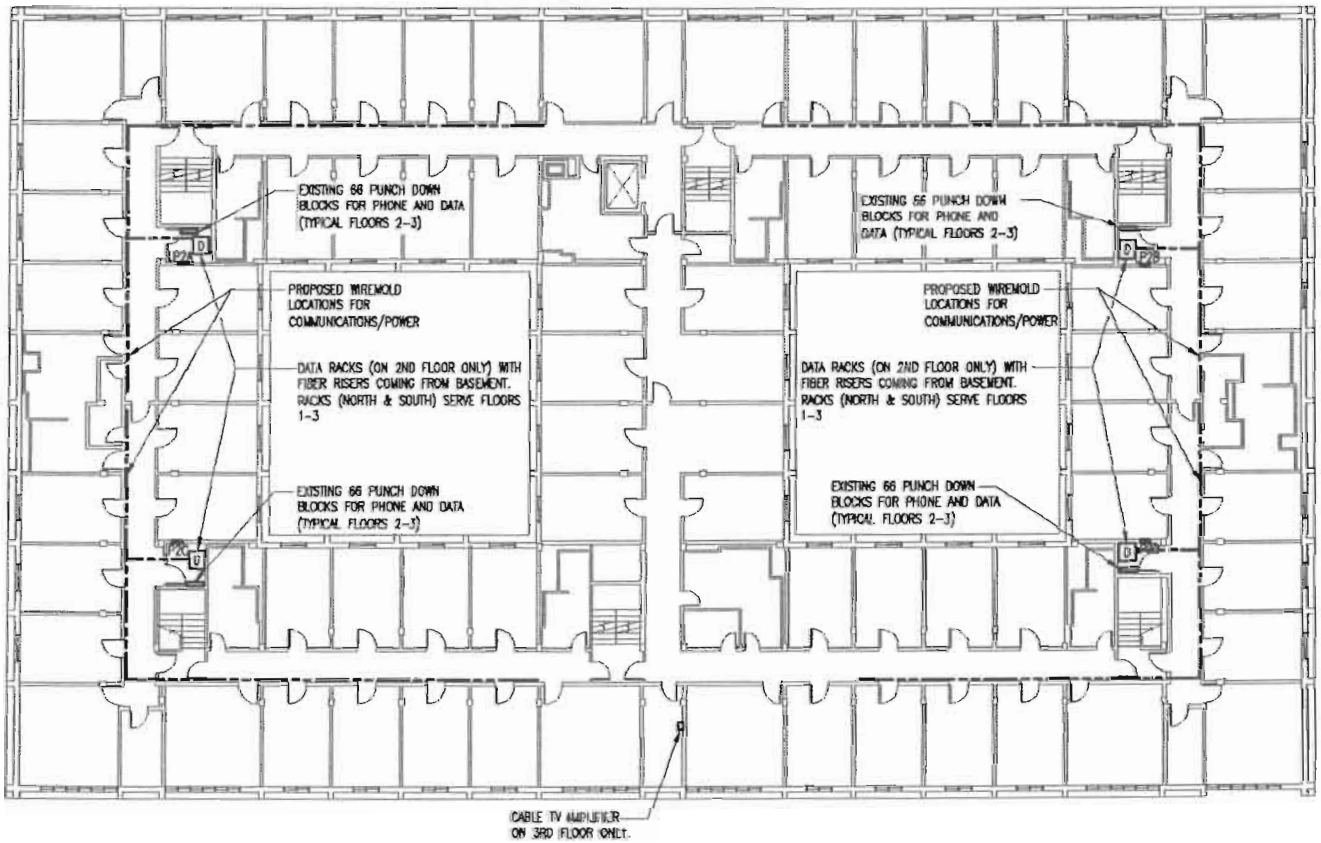
A typical floor provides communication and power services at the outer ends of the building. Since there are no residence rooms within the core of the floor, Delta Engineers, P.C recommends radial extensions of the cables and raceway systems from the service location points, along the connecting corridors, and into the residence rooms that are located nearest to the service location points.

Delta Engineers, P.C. recommends the addition of approximately 210 data outlets to this residence hall.

Delta Engineers, P.C. does not suggest "closing the loop" between the service point at the ends of the building since there is sufficient capacity in the service points for the adjacent residence rooms.

For security purposes, Delta Engineers, P.C. recommends that a card access be added to the room that contains the existing data racks and voice cable punch down blocks.

Following is a typical floor plan with a suggested raceway layout.



1 / S2 TYPICAL CAYUGA HALL FLOOR PLAN

SCALE: NONE

NORTH

Onondaga Hall

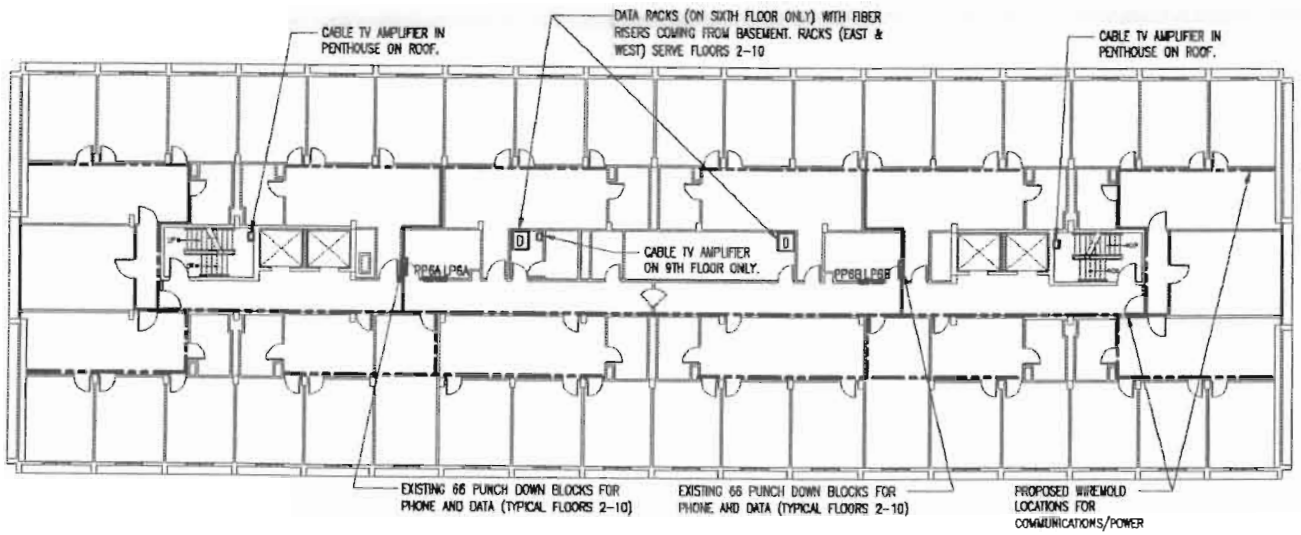
The layout of a typical floor places the residence rooms adjacent to the exterior walls of the building with a "buffer zone" of spaces that separate the residence rooms from the central corridors.

Delta Engineers, P.C. recommends the addition of approximately 360 data outlets to this residence hall.

The following layout suggests paths for the cables and raceway distribution systems that provide the connectivity between the residence rooms and the service location points. The single central corridor provides the "main backbone" for the distribution system with "Tee" connections from that backbone to the respective residence rooms.

For security, Delta Engineers, P.C. recommends that the existing rooms that contain the data, TV, and voice equipment be isolated from other non-electrical services through the relocation of those non-electrical services to other areas of the building. A card access system should be added to the existing room that contains the communication equipment.

Following is a typical floor plan with a suggested raceway layout.



1/E4 TYPICAL ONONDAGA HALL FLOOR PLAN

SCALE: NONE

NORTH

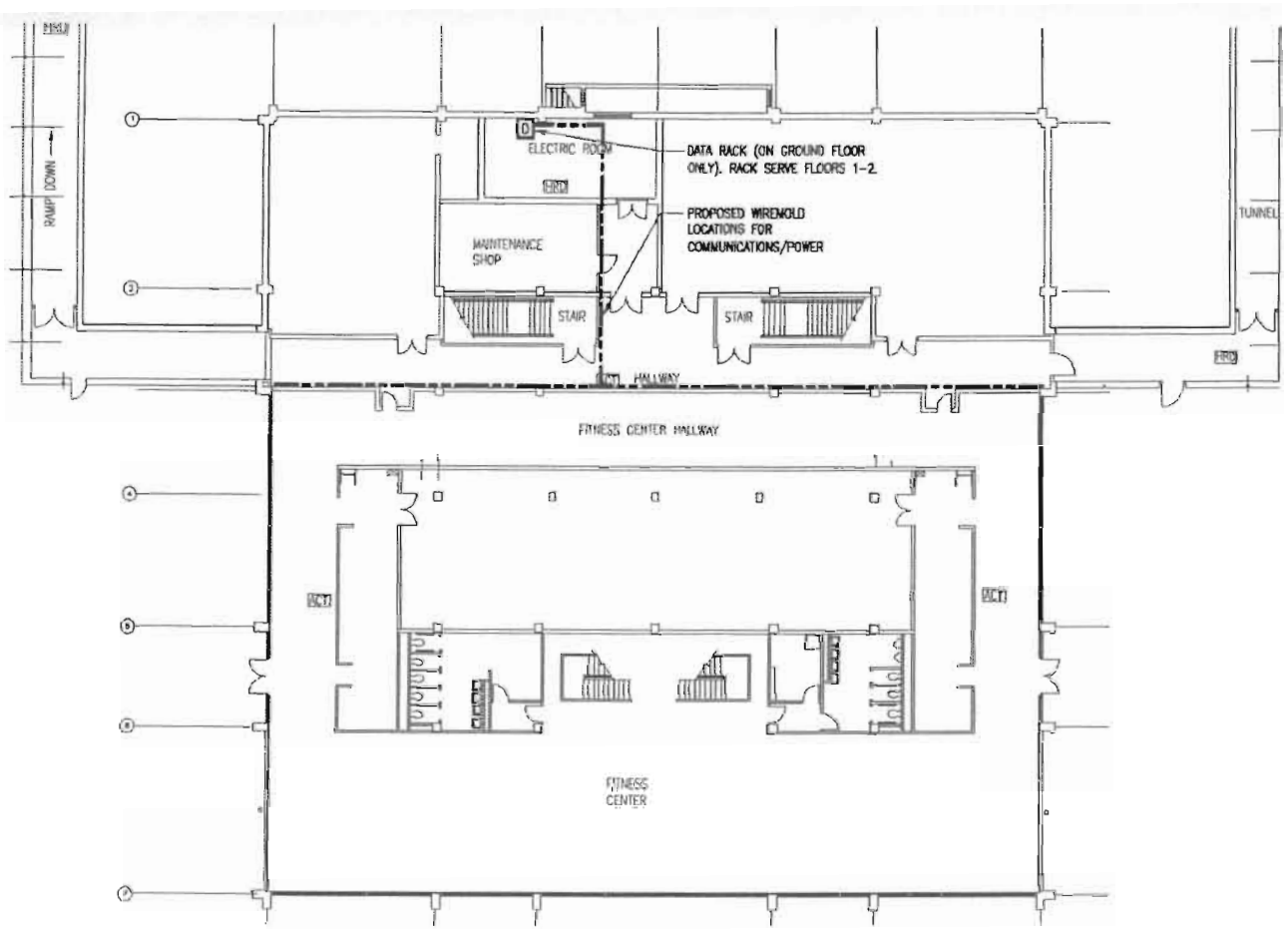
Littlepage Dining Hall

Because the service locations are not located adjacent to the central corridor, the raceway systems for this building will form a "Tee" arrangement such that the services are extended to the central corridor prior to distribution along the length of that corridor.

In general, the raceway system between the service location and the corridor should be maximized to permit expansion of the cable networks at a later date. In the corridor, the raceway system will reduce in size in accordance with the cable capacity requirements.

For security, walls and doors should be constructed around the existing communication equipment. The doors to that new room should be protected by a card access system.

Following is a typical floor plan with a suggested raceway layout.

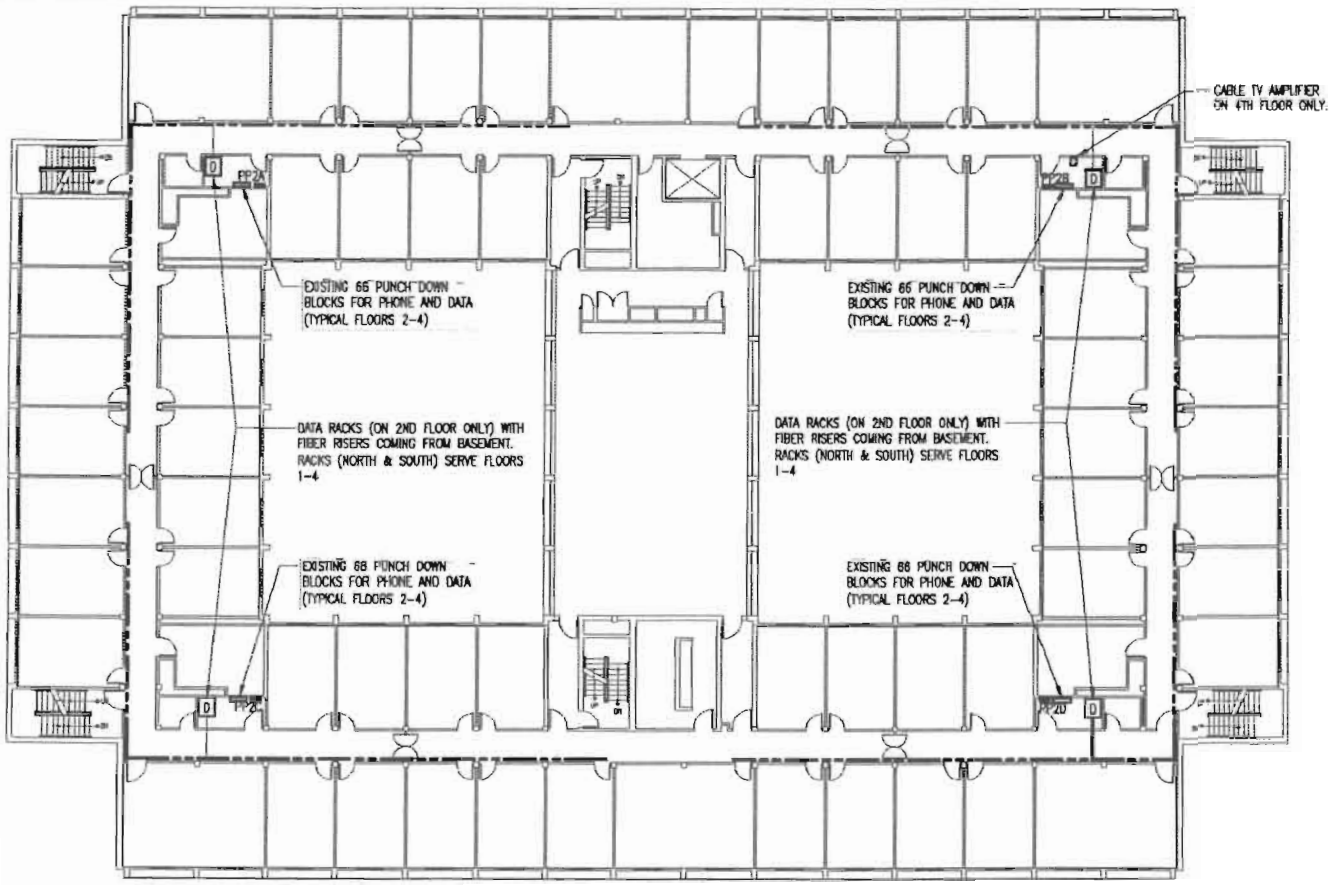

RAMP DOWN
ELECTRIC ROOM
DATA RACK (ON GROUND FLOOR ONLY). RACK SERVE FLOORS 1-2.
PROPOSED WIREMOLD LOCATIONS FOR COMMUNICATIONS/POWER
MAINTENANCE SHOP
STAIR
STAIR
TUNNEL
HALLWAY
FITNESS CENTER HALLWAY
FITNESS CENTER
1
E13
TYPICAL LITTLEPAGE HALL FLOOR PLAN
SCALE: NONE
NORTH

Service points on a typical floor are located adjacent to the four corners of the building. Since in the opinion of Delta Engineers, P.C. each service point has adequate capacity to serve the adjacent residence rooms, the cable and raceway distribution system could be divided into four segments as shown on the following floor plan.

Delta Engineers, P.C. recommends the addition of approximately 440 data outlets to this residence hall.

For security, Delta Engineers, P.C. recommends that the existing rooms that contain the data, TV, and voice equipment be isolated from other non-electrical services through the relocation of those non-electrical services to other areas of the building. A card access system should be added to the existing room that contains the communication equipment.

Following is a typical floor plan with a suggested raceway layout.



1/E5 TYPICAL ONEIDA MALL FLOOR PLAN

SCALE: NONE

NORTH

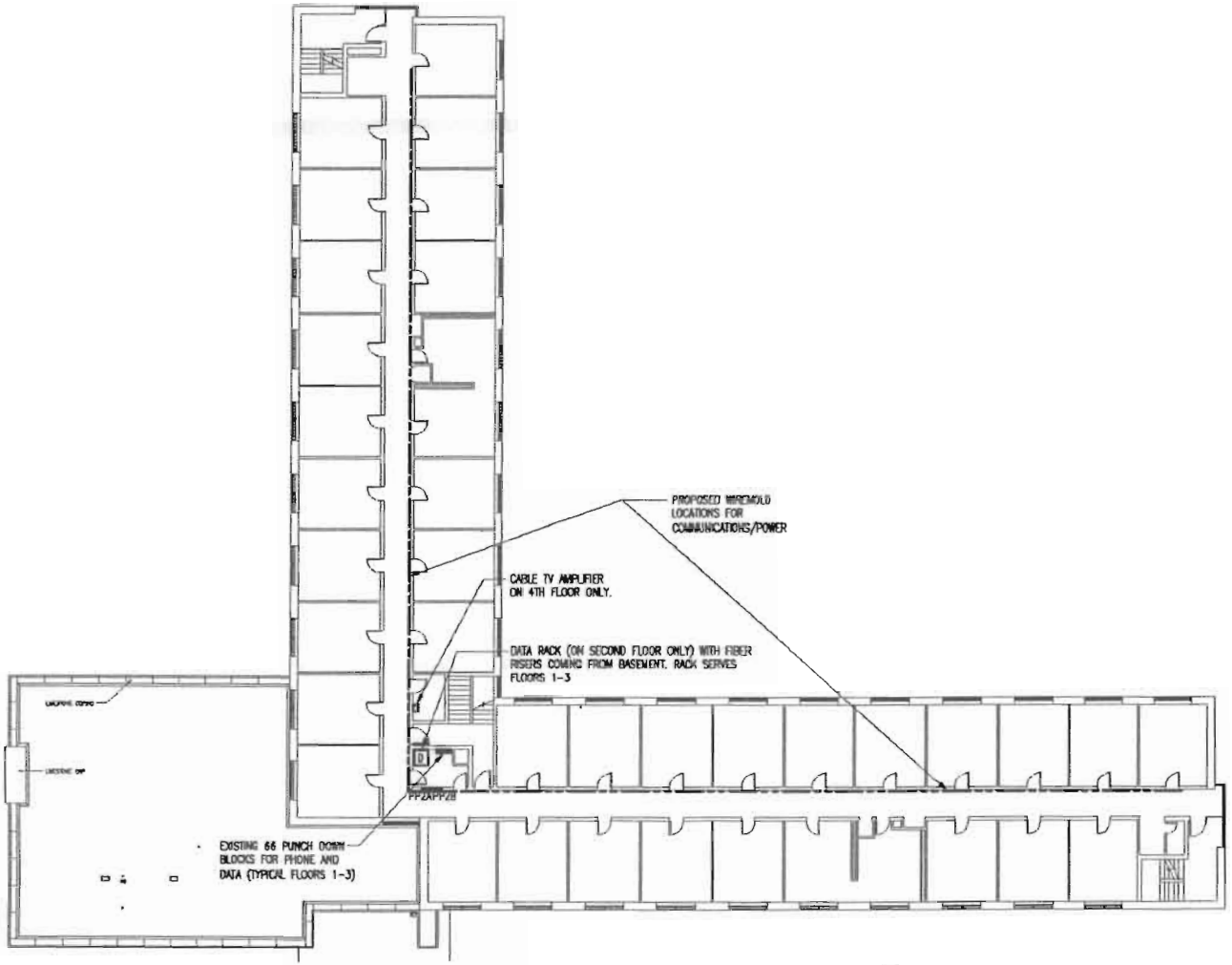
Scales Hall

The service distribution points on a typical floor are located at the "knee" of the "L" shaped floor. Therefore, the cable and raceway distribution system would begin at the service location point and extend in two opposing directions in order to serve the residence rooms.

Delta Engineers, P.C. recommends the addition of approximately 120 data outlets to this residence hall.

For security, Delta Engineers, P.C. recommends that the existing rooms that contain the data, TV, and voice equipment be isolated from other non-electrical services through the relocation of those non-electrical services to other areas of the building. A card access system should be added to the existing room that contains the communication equipment.

Following is a typical floor plan with a suggested raceway layout.



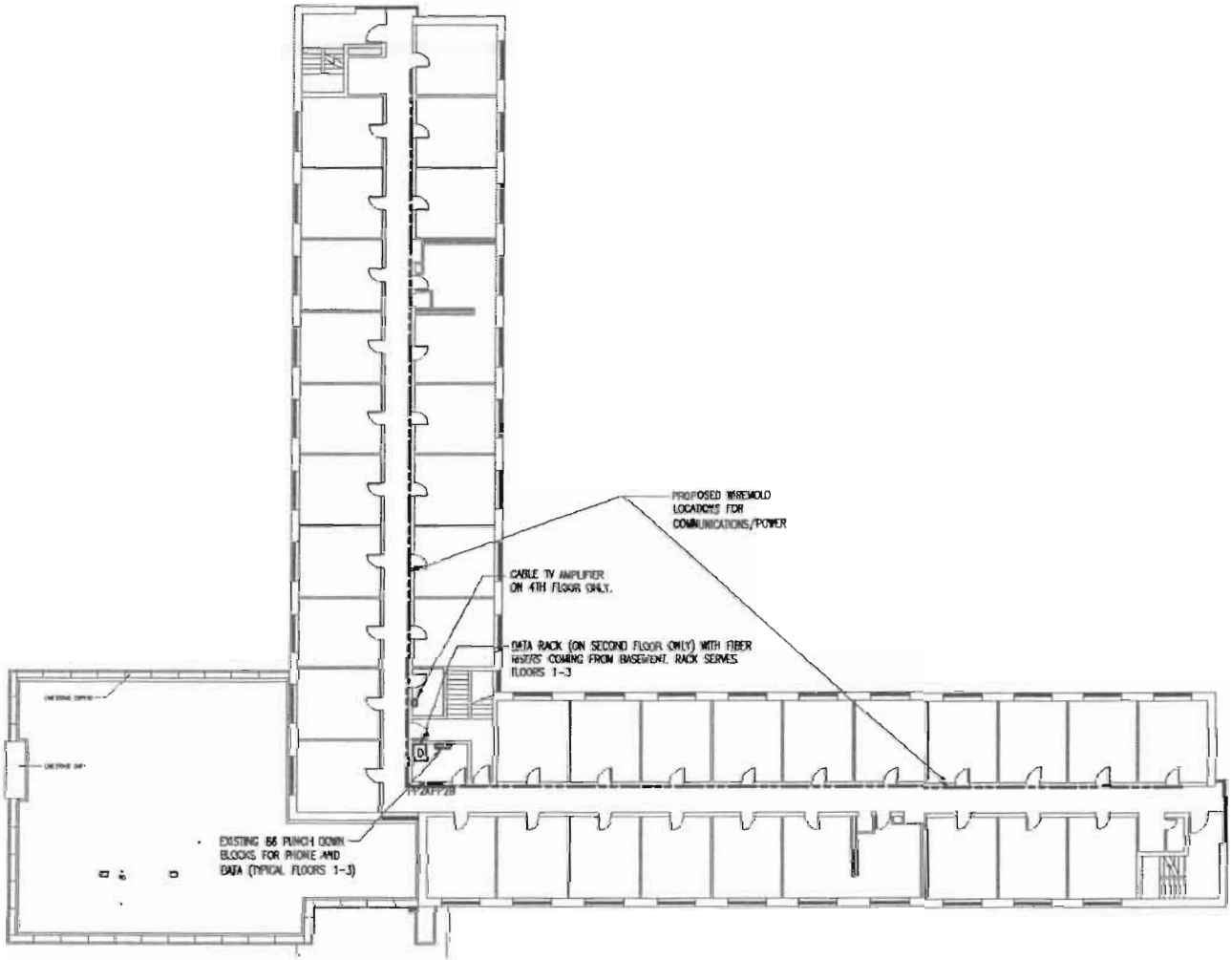
1
E6
TYPICAL SCALES HALL FLOOR PLAN
SCALE: NONE

The service distribution points on a typical floor are located at the "knee" of the "L" shaped floor. Therefore, the cable and raceway distribution system would begin at the service location point and extend in two opposing directions in order to serve the residence rooms.

Delta Engineers, P.C. recommends the addition of approximately 120 data outlets to this residence hall.

For security, Delta Engineers, P.C. recommends that the existing rooms that contain the data, TV, and voice equipment be isolated from other non-electrical services through the relocation of those non-electrical services to other areas of the building. A card access system should be added to the existing room that contains the communication equipment.

Following is a typical floor plan with a suggested raceway layout.



1/E7 TYPICAL WATERBURY HALL FLOOR PLAN

SCALE: NONE

NORTH

Action Plan Number Two:

General Description:

This plan would utilize the services of Time Warner Cable, Business Class in order to improve the data transport and television transport systems in the residence halls.

In order to provide these improvements, Time Warner has proposed a strategy that would improve the capacity of the existing television fiber optic transport system, provide a new television cable distribution system within the existing residence halls, provide cable modems within each residence room, and add Road Runner services (Time Warner's proprietary television, telephone, and data distribution system).

A copy of Time Warner's strategy is attached to this report. The following is an excerpt of the details of that strategy.

Cable Topology:

The proposed distribution network will be a fiber to feeder type of distribution that will utilize the existing SUNY single mode fibers to connect to a node location. (Nodes are defined as electronic devices that receive optical signals that carry the complete channel bandwidth and then convert those signals to a radio frequency "RF" signal. The RF signals are then translated by the end-user cable modem). Distribution from the node to the residence room will, in general, be passive but some of the larger residence halls may require additional amplifiers to maintain signal levels.

Time Warner will install a single cable modem in each residence room in a fixed and secure location. Each student within the room would attach to that modem device.

Television signals to the individual rooms will not be distributed through the cable modem but will have a separate RF output port that will provide the TV service. The television signal will be a combination of analog and digital signals that will not require any additional equipment unless the resident requests additional service products.

Time Warner does not expect to add to or modify the existing copper/fiber backbones.

Time Warner would install new distribution cables in new and/or existing surface raceway systems provided by the University. Time Warner would install surface raceway systems within each residence room as necessary to connect to the service demarcation location (cable modem).

In general, the distribution will be a "homerun" methodology that will provide services to 4,177 students in residences in the following buildings:

Cayuga Hall
Hart Hall
Mackin Hall
Onondaga Hall
Seneca Hall
Riggs Hall
Funnelle Hall
Johnson Hall
Oneida Hall
Scales Hall
Waterbury Hall
Shady Shores Home

Redundancy/Reliability:

The existing Time Warner facilities provide service redundancies that are built in to the existing transport system. In most cases, with the exception of catastrophic damage to fiber systems, outages should be confined to individual buildings.

The existing transport system has ring architecture that will reduce the total channel outages. In addition, Time Warner suggests that the University provide UPS backup for the headend portion of the SUNY system.

Time Warner will provide service technicians on a 24/7 standby arrangement.

Communication Services:

Time Warner will provide internet access, television, and digital telephone services. Digital telephone services, however, are at additional cost.

Time Warner will assign a range of public IP addresses to the campus. The addresses will be assigned dynamically to the cable modem users.

Time Warner will provide static direct routing of on-campus users that request campus resources rather than indirect access through the University web site.

The Time Warner scheme will not provide email services to the users. Time Warner suggests that the users retain their individual *.edu addresses and mailboxes.

Time Warner will not provide analog telephone services. The University must maintain the existing analog phone transport and distribution system for those services.

Although not guaranteed, the scheme proposes data communication speeds as follows:

Single Rooms -	512Kbps upstream, 3Mbps downstream
Double Rooms -	768Kbps upstream, 4Mbps downstream
Triple Rooms -	1.5Mbps upstream, 6Mbps downstream
Quad Rooms -	2Mbps upstream, 10Mbps downstream

Special Considerations:

Time Warner will not remove any existing wiring. The University will be responsible for removal of existing cabling and equipment that are not required for the upgrade. This will include existing cabling that services data, analog telephone, and television services.

Time Warner will require space, probably in Lannigan Hall, for additional transport equipment. The space must be sized for four full size (7ft by 22in) equipment racks along with a 100 ampere power feed. The power feed would provide energy for the additional equipment and UPS backup components.

Time Warner will provide design wiring diagrams prior to construction and will also provide final record drawings at the completion of the construction. In addition, Time Warner will require copies of the existing fiber optic cable installation drawings.

BUDGET COSTS:

If the University decides to rewire and upgrade the exiting transport systems then the following budget costs would apply:

Mackin Dining Hall - $35,118
Funnelle Hall - $238,475
Cooper Dining Hall - $23,412
Seneca Hall - $314,723
Pathfinder Dining Hall - $23,412
Cayuga Hall - $186,751

Onondaga Hall - $399,685
Littlepage Dining Hall - $23,412
Oneida Hall - $235,580
Scales Hall - $129,437
Waterbury Hall - $129,437

PROJECT TOTAL - $1,739,442

If the University decides to contract with a vendor to perform the upgrades then the following budget costs would apply:

Base cost for new wiring and upgrades by Time Warner - $339,000
Mackin Dining Hall - $30,000
Funnelle Hall - $157,000
Cooper Dining Hall - $22,000
Seneca Hall - $202,000
Pathfinder Dining Hall - $22,000
Cayuga Hall - $116,000
Onondaga Hall - $273,000
Littlepage Dining Hall - $22,000
Oneida Hall - $106,000
Scales Hall - $84,000
Waterbury Hall - $84,000

PROJECT TOTAL - $1,457,000

RECOMMENDATIONS:

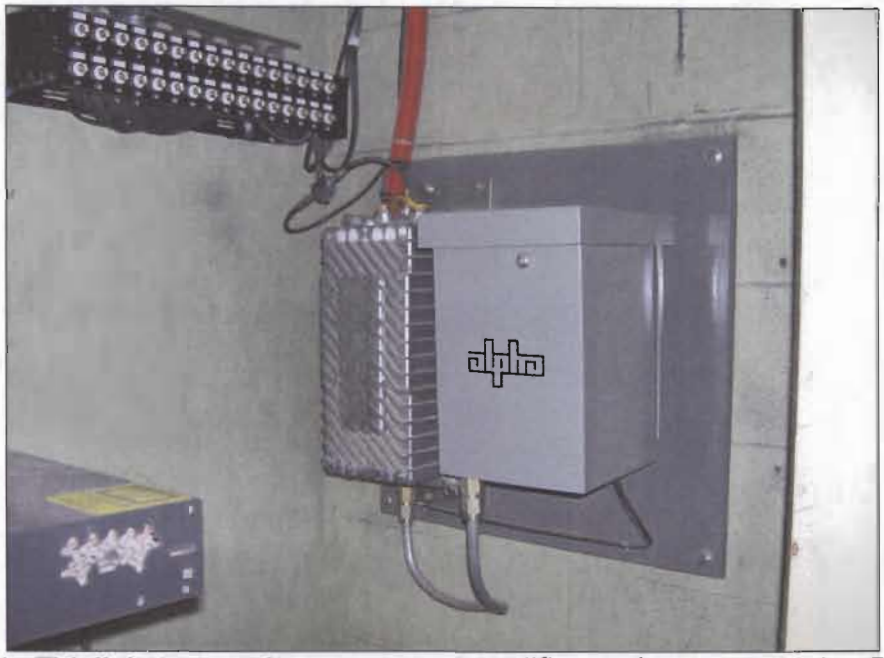
Both plans of action require that the University provide not only a surface raceway system throughout the residence halls for the upgrade communication wiring but the University must also replace electrical power panels, branch power circuits, add additional convenience outlets, and perform asbestos abatement.

The project total budget costs include these common requirements but do not reflect the University's previous large capital investment for exiting transport equipment. The University should assess that investment and include the value in the choice between action plans.

Because of the existing large capital investment in equipment and the relatively small difference in costs of the two plans, Delta Engineers, P.C. recommends that the University follow Action Plan Number One.

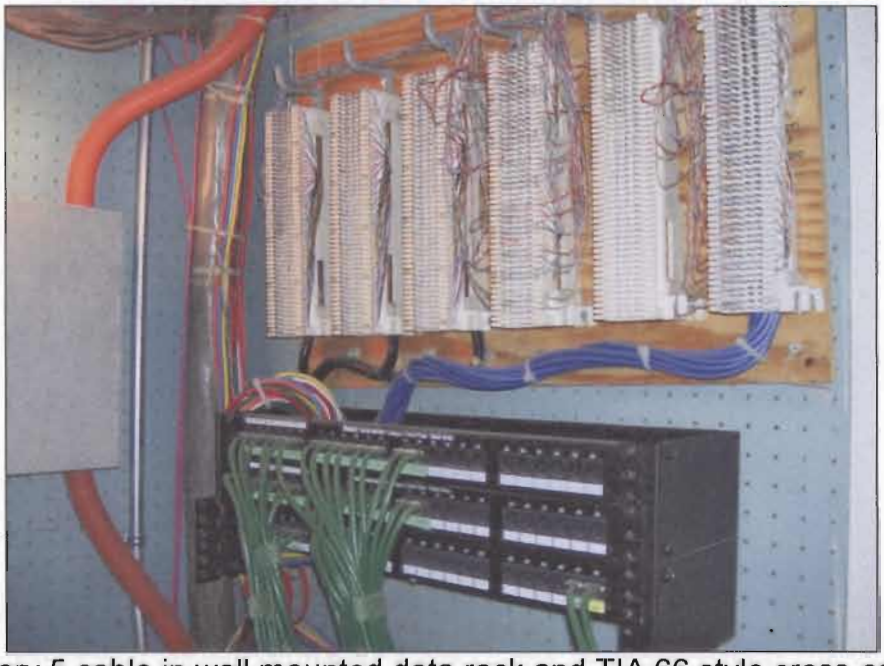
PHOTOGRAPHS:

Tele/Data outlets in the residence rooms provide one RJ-45 jack for data and a second RJ-11 jack for voice. These jacks each share one pair of the two-pair Category 3 voice cable.

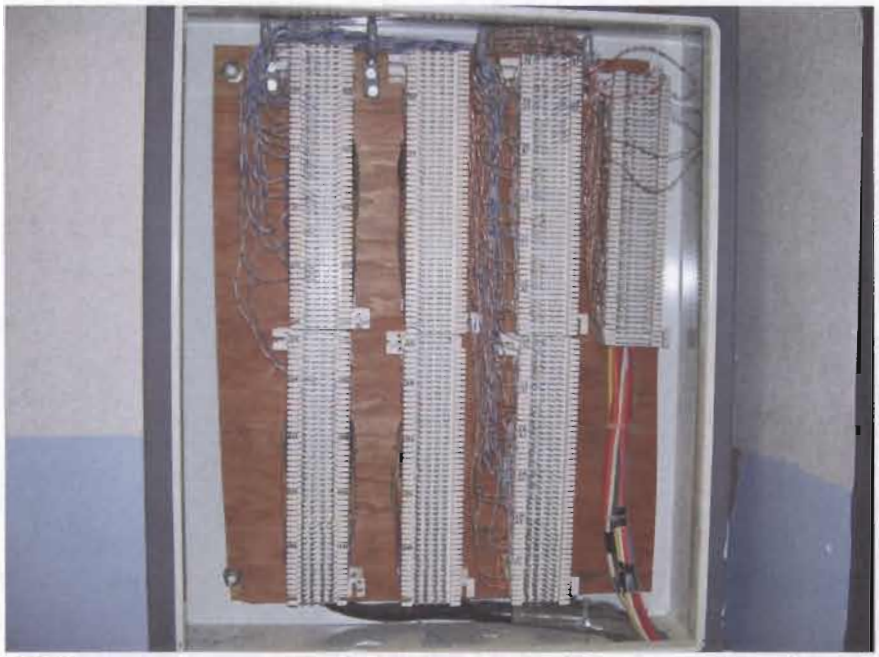


Cable TV digital to analog converter/amplifier and power supply. Delta recommends the complete replacement of the downstream analog wiring and devices.

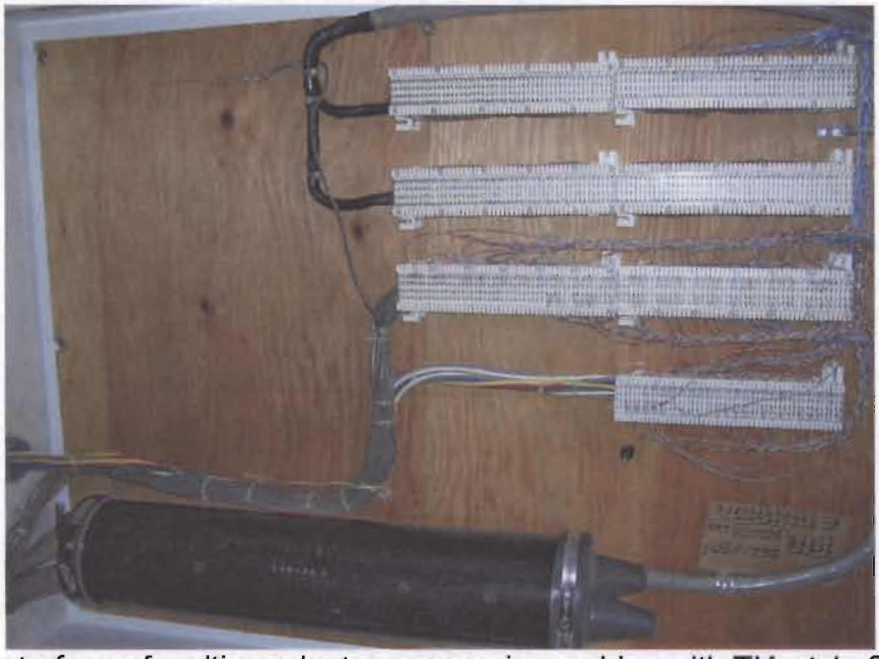
"feed-through" type CATV wall jack in resisdence room. These types of jacks make it difficult to balance signed levels throughout the sustem.



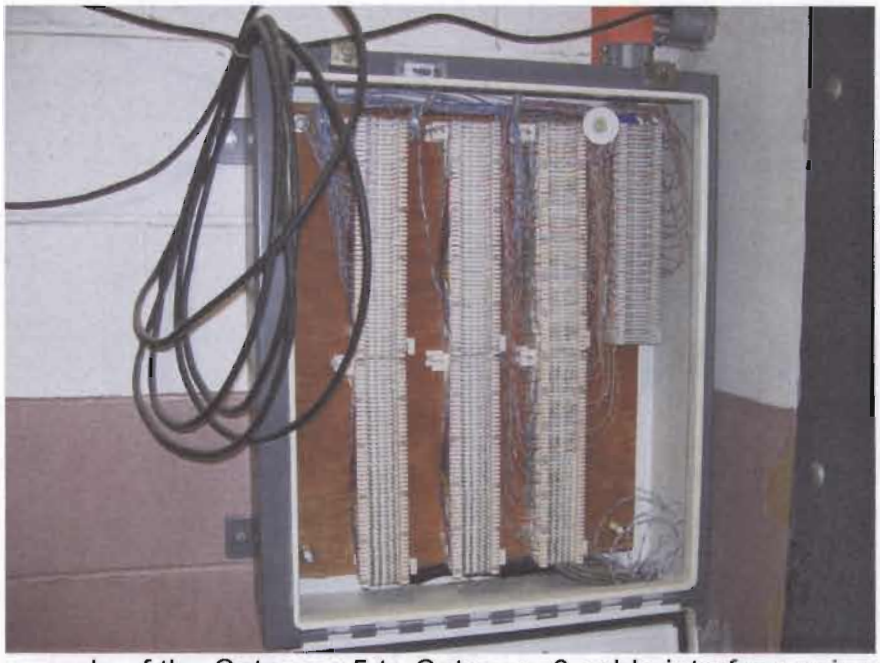
Category 5 cable in wall mounted data rack and TIA 66 style cross-connect modules. The cross-connect modules permit the Category 5 cables to interface with the Category 3 horizontal voice cable system.



Tele/Data distribution panel containing TIA style 66 cross-connect modules used to distribute category 3 cable to the residence rooms. The upper right cross-connect module is representative of the Category 5 to Category 3 interface.



Typical interface of multi-conductor copper riser cables with TIA style 66 cross-connect modules. The bottom cross-connect module is representative of a Category 5 to
Category 3 cable interface.



Another example of the Category 5 to Category 3 cable interface using standard TIA cross-connect modules.

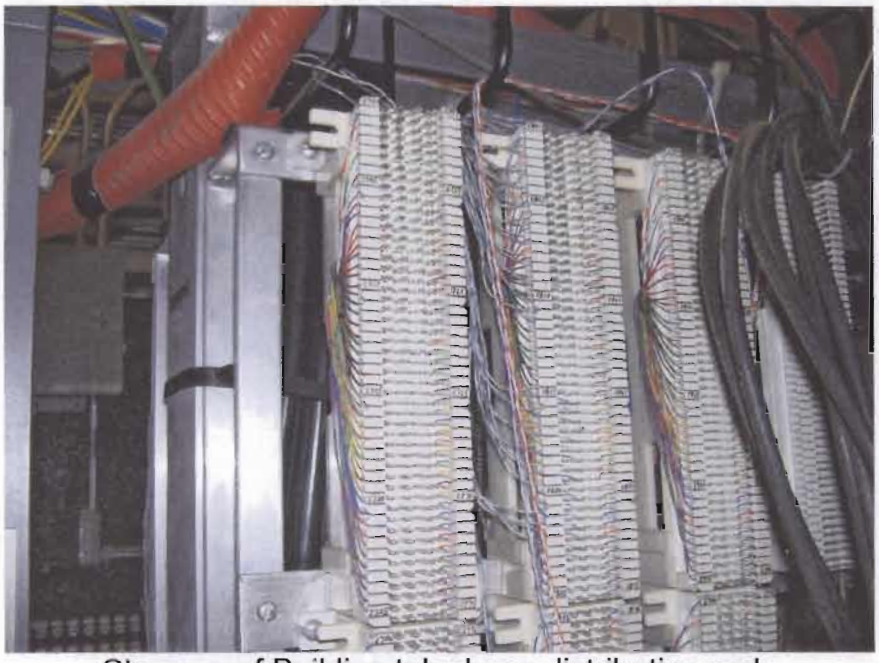
Close up view of the Category 5 cables entering the TIA style 66 modules and cross connected to Category 3 cables for distribution to the residence rooms. The multi-colored cables are the Category 5 distribution wires from the local data equipment cabinet.

Data distribution rack located on intermediate floors of residence hall. This cabinet contains fiber-fed distribution switches, Category 5 patch panels, and power supplies for distribution of data signals. Category 5 cables rise from these cabinets to voice distribution cabinets spaced throughout the building. This cabinet is located in a general storage room.

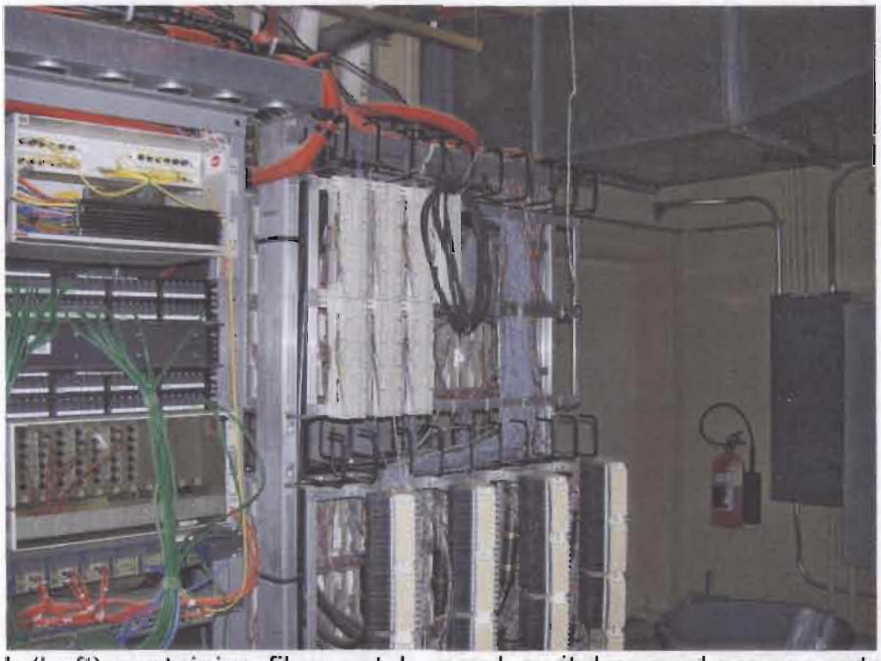
Data Distribution cabinet. Incoming fiber gets routed through switches to standard TIA/EIA Category 5 patch panels. In most cases, the Category 5 cables terminate on standard TIA style 66 cross-connect modules for interface with the Category 3 voice cables serving the respective residence hall rooms.

Typical Fiber Patch Panel located in a data equipment rack.

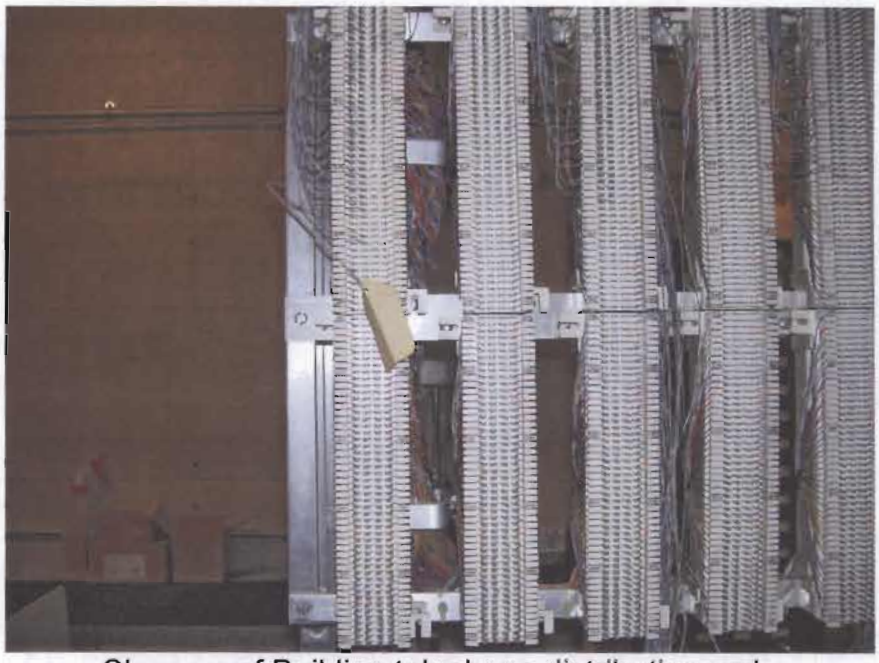
Incoming voice distribution system termination equipment. Incoming cables terminate on the service protective devices. The output side of the service protective devices serve the voice riser cables that extend through the building to the various telephone cabinets.



Close up of Building telephone distribution rack.



Data Rack (Left) containing fiber patch panel, switches and copper patch panels.
Building Telephone distribution rack is on right.



Close up of Building telephone distribution rack.

Wall mounted building telephone termination and cross connect equipment.

Existing power panel that feeds residence rooms. Delta recommends the replacement of these panels due to age of the equipment and lack of space for the additional circuits required to properly serve the outlets in the residence rooms.

Another view of a residence hall power panel.

Appendix B

DELTA ENGINEERS

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PROJECT:	OSWEGO COMMUNICATION STUDY			PROJECT MANAGER:					0	PHASE:		0			PROJ. NO:	0
LOCATION:	0			ESTIMATED BY:		0				CHK BY:		0			DATE:	6/12/2007
		QUANTITY		MATERIAL						LABOR						
ITEM NO.	ITEM DESCRIPTION	NO.	UNIT	MEANS' BARE COST	SALES TAX	SUB'S PROFIT	COST INDEX	UNIT PRICE	TOTAL	MEANS' BARE COST	SUB'S O&P	COST INDEX	UNIT PRICE	TOTAL	TOTAL COST
	MACKIN														
	COMM WIREMOLD - 250FT/FL FOR 3 FLOORS	750	FT	$5.25	1.00	1.10	1.000	$5.78	$4,331	$5.15	1.475	1.000	$7.60	$5,697	$10,028.44
	PWR WIREMOLD - 250FT/FL FOR 3 FLOORS	750	FT	$5.25	1.00	1.10	1.000	$5.78	$4,331	$5.15	1.475	1.000	$7.60	$5,697	$10,028.44
	DATA CABLES - AVG 100FT/RM, 5RM/FL FOR 3FL	15	CLF	$15.30	1.00	1.10	1.000	$16.83	$252	$48.00	1.475	1.000	$70.80	$1,062	$1,314.45
	BRANCH CKT 1/RM,5RM/FL,3FL, AVG 100FT/CKT	15	CLF	$6.40	1.00	1.10	1.000	$7.04	$106	$30.50	1.475	1.000	$44.99	$675	$780.41
	ELECT PANELS - 1/FL FOR 3 FLOORS	3	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$5,528	$1,300.00	1.475	1.000	$1,917.50	$5,753	$11,280.00
	RECEPT 4/RM, 5RM/FL, FOR 3 FLOORS	60	EA	$8.85	1.00	1.10	1.000	$9.74	$584	$12.45	1.475	1.000	$18.36	$1,102	$1,685.93
	MACKIN TOTAL														$35,117.66
	FUNNELLE														
	COMM WIREMOLD - 460FT/FL FOR 8 FLOORS	3680	FT	$5.25	1.00	1.10	1.000	$5.78	$21,252	$5.15	1.475	1.000	$7.60	$27,954	$49,206.20
	PWR WIREMOLD - 460FT/FL FOR 8 FLOORS	3680	FT	$5.25	1.00	1.10	1.000	$5.78	$21,252	$5.15	1.475	1.000	$7.60	$27,954	$49,206.20
	DATA CABLES - AVG 100FT/RM, 26RM/FL FOR 8F	208	CLF	$15.30	1.00	1.10	1.000	$16.83	$3,501	$48.00	1.475	1.000	$70.80	$14,726	$18,227.04
	BRANCH CKT 1/RM,26RM/FL,8FL, AVG 100FT/CKT	208	CLF	$6.40	1.00	1.10	1.000	$7.04	$1,464	$30.50	1.475	1.000	$44.99	$9,357	$10,821.72
	ELECT PANELS - 2/FL FOR 3 FLOORS	6	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$11,055	$1,300.00	1.475	1.000	$1,917.50	$11,505	$22,560.00
	RECEPT 4/RM, 26RM/FL, FOR 8 FLOORS	832	EA	$8.85	1.00	1.10	1.000	$9.74	$8,100	$12.45	1.475	1.000	$18.36	$15,279	$23,378.16
	ADDITIONAL DATA OUTLET CABLES	245	CLF	$15.30	1.00	1.10	1.000	$16.83	$4,123	$48.00	1.475	1.000	$70.80	$17,346	$21,469.35
	ADDITIONAL DATA OUTLETS	245	EA	$2.20	1.00	1.10	1.000	$2.42	$593	$7.30	1.475	1.000	$10.77	$2,638	$3,230.94
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	10	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$16,775	$1,600.00	1.475	1.000	$2,360.00	$23,600	$40,375.00
	FUNNELLE TOTAL														$238,474.61
	COOPER														
	COMM WIREMOLD - 250FT/FL FOR2 FLOORS	500	FT	$5.25	1.00	1.10	1.000	$5.78	$2,888	$5.15	1.475	1.000	$7.60	$3,798	$6,685.63
	PWR WIREMOLD - 460FT/FL FOR 8 FLOORS	500	FT	$5.25	1.00	1.10	1.000	$5.78	$2,888	$5.15	1.475	1.000	$7.60	$3,798	$6,685.63
	DATA CABLES - AVG 100FT/RM, 5RM/FL FOR 2FL	10	CLF	$15.30	1.00	1.10	1.000	$16.83	$168	$48.00	1.475	1.000	$70.80	$708	$876.30
	BRANCH CKT 1/RM,5RM/FL,3FL, AVG 100FT/CKT	10	CLF	$6.40	1.00	1.10	1.000	$7.04	$70	$30.50	1.475	1.000	$44.99	$450	$520.28
	ELECT PANELS - 1/FL FOR 2 FLOORS	2	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$3,685	$1,300.00	1.475	1.000	$1,917.50	$3,835	$7,520.00
	RECEPT 4/RM, 5RM/FL, FOR 2 FLOORS	40	EA	$8.85	1.00	1.10	1.000	$9.74	$389	$12.45	1.475	1.000	$18.36	$735	$1,123.95
	COOPER TOTAL														$23,411.78

Reference: RS**Means** Cost Data 2007

PAGE 1 TOTAL **$297,004**

DELTA ENGINEERS

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PROJECT:	OSWEGO COMMUNICATION STUDY			PROJECT MANAGER:	0	PHASE:	0		PROJ. NO:	0
LOCATION:	0			ESTIMATED BY:	0	CHK BY:	0		DATE:	6/12/2007

		QUANTITY		MATERIAL						LABOR					
ITEM NO.	ITEM DESCRIPTION	NO.	UNIT	MEANS' BARE COST	SALES TAX	SUB'S PROFIT	COST INDEX	UNIT PRICE	TOTAL	MEANS' BARE COST	SUB'S O&P	COST INDEX	UNIT PRICE	TOTAL	TOTAL COST
	SENECA														
	COMM WIREMOLD - 335FT/FL FOR 9 FLOORS	3015	FT	$5.25	1.00	1.10	1.000	$5.78	$17,412	$5.15	1.475	1.000	$7.60	$22,903	$40,314.32
	COMM WIREMOLD - 335FT/FL FOR 9 FLOORS	3015	FT	$5.25	1.00	1.10	1.000	$5.78	$17,412	$5.15	1.475	1.000	$7.60	$22,903	$40,314.32
	DATA CABLES - AVG 100FT/RM, 36RM/FL FOR 9	324	CLF	$15.30	1.00	1.10	1.000	$16.83	$5,453	$48.00	1.475	1.000	$70.80	$22,939	$28,392.12
	BRANCH CKT 1/RM,26RM/FL,8FL, AVG 100FT/CK	324	CLF	$6.40	1.00	1.10	1.000	$7.04	$2,281	$30.50	1.475	1.000	$44.99	$14,576	$16,856.91
	ELECT PANELS - 2/FL FOR 9 FLOORS	18	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$33,165	$1,300.00	1.475	1.000	$1,917.50	$34,515	$67,680.00
	RECEPT 4/RM, 36RM/FL, FOR 9 FLOORS	1296	EA	$8.85	1.00	1.10	1.000	$9.74	$12,617	$12.45	1.475	1.000	$18.36	$23,799	$36,415.98
	ADDITIONAL DATA OUTLET CABLES	320	CLF	$15.30	1.00	1.10	1.000	$16.83	$5,386	$48.00	1.475	1.000	$70.80	$22,656	$28,041.60
	ADDITIONAL DATA OUTLETS	320	EA	$2.20	1.00	1.10	1.000	$2.42	$774	$7.30	1.475	1.000	$10.77	$3,446	$4,220.00
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	13	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$21,808	$1,600.00	1.475	1.000	$2,360.00	$30,680	$52,487.50
	SENECA TOTAL														$314,722.75
	PATHFINDER														
	COMM WIREMOLD - 250FT/FL FOR2 FLOORS	500	FT	$5.25	1.00	1.10	1.000	$5.78	$2,888	$5.15	1.475	1.000	$7.60	$3,798	$6,685.63
	PWR WIREMOLD - 460FT/FL FOR 8 FLOORS	500	FT	$5.25	1.00	1.10	1.000	$5.78	$2,888	$5.15	1.475	1.000	$7.60	$3,798	$6,685.63
	DATA CABLES - AVG 100FT/RM, 5RM/FL FOR 2F	10	CLF	$15.30	1.00	1.10	1.000	$16.83	$168	$48.00	1.475	1.000	$70.80	$708	$876.30
	BRANCH CKT 1/RM,5RM/FL,3FL, AVG 100FT/CKT	10	CLF	$6.40	1.00	1.10	1.000	$7.04	$70	$30.50	1.475	1.000	$44.99	$450	$520.28
	ELECT PANELS - 1/FL FOR 2 FLOORS	2	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$3,685	$1,300.00	1.475	1.000	$1,917.50	$3,835	$7,520.00
	RECEPT 4/RM, 5RM/FL, FOR 2 FLOORS	40	EA	$8.85	1.00	1.10	1.000	$9.74	$389	$12.45	1.475	1.000	$18.36	$735	$1,123.95
	PATHFINDER TOTAL														$23,411.78

Reference: RS**Means** Cost Data 2007

PAGE 2 TOTAL	**$338,135**
TOTAL FROM PAGE 1	**$297,004**
SUBTOTAL	**$635,139**

DELTA ENGINEERS

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PROJECT:	OSWEGO COMMUNICATION STUDY	PROJECT MANAGER:	0	PHASE:	0	PROJ. NO:	0
LOCATION:	0	ESTIMATED BY:	0	CHK BY:	0	DATE:	6/12/2007

		QUANTITY		MATERIAL						LABOR					
ITEM NO.	ITEM DESCRIPTION	NO.	UNIT	MEANS' BARE COST	SALES TAX	SUB'S PROFIT	COST INDEX	UNIT PRICE	TOTAL	MEANS' BARE COST	SUB'S O&P	COST INDEX	UNIT PRICE	TOTAL	TOTAL COST
	CAYUGA														
	COMM WIREMOLD - 550FT/FL FOR 4 FLOORS	2200	FT	$5.25	1.00	1.10	1.000	$5.78	$12,705	$5.15	1.475	1.000	$7.60	$16,712	$29,416.75
	PWR WIREMOLD - 550FT/FL FOR 4 FLOORS	2200	FT	$5.25	1.00	1.10	1.000	$5.78	$12,705	$5.15	1.475	1.000	$7.60	$16,712	$29,416.75
	DATA CABLES - AVG 100FT/RM, 40RM/FL FOR 4	160	CLF	$15.30	1.00	1.10	1.000	$16.83	$2,693	$48.00	1.475	1.000	$70.80	$11,328	$14,020.80
	BRANCH CKT 1/RM,40RM/FL,4FL, AVG 100FT/CK	160	CLF	$6.40	1.00	1.10	1.000	$7.04	$1,126	$30.50	1.475	1.000	$44.99	$7,198	$8,324.40
	ELECT PANELS - 2/FL FOR 4 FLOORS	8	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$14,740	$1,300.00	1.475	1.000	$1,917.50	$15,340	$30,080.00
	RECEPT 4/RM,40RM/FL, FOR 4 FLOORS	640	EA	$8.85	1.00	1.10	1.000	$9.74	$6,230	$12.45	1.475	1.000	$18.36	$11,753	$17,983.20
	ADDITIONAL DATA OUTLET CABLES	210	CLF	$15.30	1.00	1.10	1.000	$16.83	$3,534	$48.00	1.475	1.000	$70.80	$14,868	$18,402.30
	ADDITIONAL DATA OUTLETS	210	EA	$2.20	1.00	1.10	1.000	$2.42	$508	$7.30	1.475	1.000	$10.77	$2,261	$2,769.38
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	9	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$15,098	$1,600.00	1.475	1.000	$2,360.00	$21,240	$36,337.50
	CAYUGA TOTAL														$186,751.08
	ONONDAGA														
	COMM WIREMOLD - 600FT/FL FOR 9 FLOORS	5400	FT	$5.25	1.00	1.10	1.000	$5.78	$31,185	$5.15	1.475	1.000	$7.60	$41,020	$72,204.75
	PWR WIREMOLD - 600FT/FL FOR 9 FLOORS	5400	FT	$5.25	1.00	1.10	1.000	$5.78	$31,185	$5.15	1.475	1.000	$7.60	$41,020	$72,204.75
	DATA CABLES - AVG 100FT/RM, 40RM/FL FOR 9	360	CLF	$15.30	1.00	1.10	1.000	$16.83	$6,059	$48.00	1.475	1.000	$70.80	$25,488	$31,546.80
	BRANCH CKT 1/RM,40RM/FL,9FL, AVG 100FT/CK	360	CLF	$6.40	1.00	1.10	1.000	$7.04	$2,534	$30.50	1.475	1.000	$44.99	$16,196	$18,729.90
	ELECT PANELS - 2/FL FOR 9 FLOORS	18	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$33,165	$1,300.00	1.475	1.000	$1,917.50	$34,515	$67,680.00
	RECEPT 4/RM,40RM/FL, FOR 9 FLOORS	1440	EA	$8.85	1.00	1.10	1.000	$9.74	$14,018	$12.45	1.475	1.000	$18.36	$26,444	$40,462.20
	ADDITIONAL DATA OUTLET CABLES	360	CLF	$15.30	1.00	1.10	1.000	$16.83	$6,059	$48.00	1.475	1.000	$70.80	$25,488	$31,546.80
	ADDITIONAL DATA OUTLETS	360	EA	$2.20	1.00	1.10	1.000	$2.42	$871	$7.30	1.475	1.000	$10.77	$3,876	$4,747.50
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	15	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$25,163	$1,600.00	1.475	1.000	$2,360.00	$35,400	$60,562.50
	ONONDAGA TOTAL														$399,685.20

Reference: RSMeans Cost Data 2007

PAGE 3 TOTAL	$586,436
TOTAL FROM PAGE 2	$635,139
SUBTOTAL	$1,221,575

DELTA ENGINEERS

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A ENGINEERS	OSWEGO COMMUNICATION STUDY				0			0	PHASE:	0				0	0
ON, NY, 13901	0				0		0		CHK BY:	0				0	6/12/2007
		QUANTITY		MATERIAL						LABOR					
ITEM NO.	ITEM DESCRIPTION	NO.	UNIT	MEANS' BARE COST	SALES TAX	SUB'S PROFIT	COST INDEX	UNIT PRICE	TOTAL	MEANS' BARE COST	SUB'S O&P	COST INDEX	UNIT PRICE	TOTAL	TOTAL COST
	LITTLEPAGE														
	COMM WIREMOLD - 250FT/FL FOR2 FLOORS	500	FT	$5.25	1.00	1.10	1.000	$5.78	$2,888	$5.15	1.475	1.000	$7.60	$3,798	$6,685.63
	PWR WIREMOLD - 460FT/FL FOR 8 FLOORS	500	FT	$5.25	1.00	1.10	1.000	$5.78	$2,888	$5.15	1.475	1.000	$7.60	$3,798	$6,685.63
	DATA CABLES - AVG 100FT/RM, 5RM/FL FOR 2F	10	CLF	$15.30	1.00	1.10	1.000	$16.83	$168	$48.00	1.475	1.000	$70.80	$708	$876.30
	BRANCH CKT 1/RM,5RM/FL,3FL, AVG 100FT/CKT	10	CLF	$6.40	1.00	1.10	1.000	$7.04	$70	$30.50	1.475	1.000	$44.99	$450	$520.28
	ELECT PANELS - 1/FL FOR 2 FLOORS	2	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$3,685	$1,300.00	1.475	1.000	$1,917.50	$3,835	$7,520.00
	RECEPT 4/RM, 5RM/FL, FOR 2 FLOORS	40	EA	$8.85	1.00	1.10	1.000	$9.74	$389	$12.45	1.475	1.000	$18.36	$735	$1,123.95
	LITTLEPAGE TOTAL														$23,411.78
	ONEIDA														
	COMM WIREMOLD - 450FT/FL FOR 4 FLOORS	1800	FT	$5.25	1.00	1.10	1.000	$5.78	$10,395	$5.15	1.475	1.000	$7.60	$13,673	$24,068.25
	PWR WIREMOLD - 450FT/FL FOR 4 FLOORS	1800	FT	$5.25	1.00	1.10	1.000	$5.78	$10,395	$5.15	1.475	1.000	$7.60	$13,673	$24,068.25
	DATA CABLES - AVG 100FT/RM, 40RM/FL FOR 4	160	CLF	$15.30	1.00	1.10	1.000	$16.83	$2,693	$48.00	1.475	1.000	$70.80	$11,328	$14,020.80
	BRANCH CKT 1/RM,40RM/FL,4FL, AVG 100FT/CK	160	CLF	$6.40	1.00	1.10	1.000	$7.04	$1,126	$30.50	1.475	1.000	$44.99	$7,198	$8,324.40
	ELECT PANELS - 2/FL FOR 4 FLOORS	8	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$14,740	$1,300.00	1.475	1.000	$1,917.50	$15,340	$30,080.00
	RECEPT 4/RM,40RM/FL, FOR 4 FLOORS	640	EA	$8.85	1.00	1.10	1.000	$9.74	$6,230	$12.45	1.475	1.000	$18.36	$11,753	$17,983.20
	ADDITIONAL DATA OUTLET CABLES	440	CLF	$15.30	1.00	1.10	1.000	$16.83	$7,405	$48.00	1.475	1.000	$70.80	$31,152	$38,557.20
	ADDITIONAL DATA OUTLETS	440	EA	$2.20	1.00	1.10	1.000	$2.42	$1,065	$7.30	1.475	1.000	$10.77	$4,738	$5,802.50
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	18	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$30,195	$1,600.00	1.475	1.000	$2,360.00	$42,480	$72,675.00
	ONEIDA TOTAL														$235,579.60

Reference: RS**Means** Cost Data 2007

PAGE 4 TOTAL	**$258,991**
TOTAL FROM PAGE 3	**$1,221,575**
TOTAL	**$1,480,566**

DELTA ENGINEERS

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0	OSWEGO COMMUNICATION STUDY					0		0	PHASE:	0				0	0
SUBTOTAL	0					0		0	CHK BY:	0				635138.57	6/12/2007
		QUANTITY		MATERIAL						LABOR					
ITEM NO.	ITEM DESCRIPTION	NO.	UNIT	MEANS' BARE COST	SALES TAX	SUB'S PROFIT	COST INDEX	UNIT PRICE	TOTAL	MEANS' BARE COST	SUB'S O&P	COST INDEX	UNIT PRICE	TOTAL	TOTAL COST
	SCALES														
	COMM WIREMOLD -250FT/FL FOR 4 FLOORS	1000	FT	$5.25	1.00	1.10	1.000	$5.78	$5,775	$5.15	1.475	1.000	$7.60	$7,596	$13,371.25
	PWR WIREMOLD - 250FT/FL FOR 4 FLOORS	1000	FT	$5.25	1.00	1.10	1.000	$5.78	$5,775	$5.15	1.475	1.000	$7.60	$7,596	$13,371.25
	DATA CABLES - AVG 100FT/RM, 40RM/FL FOR 4	160	CLF	$15.30	1.00	1.10	1.000	$16.83	$2,693	$48.00	1.475	1.000	$70.80	$11,328	$14,020.80
	BRANCH CKT 1/RM,40RM/FL,4FL, AVG 100FT/CK	160	CLF	$6.40	1.00	1.10	1.000	$7.04	$1,126	$30.50	1.475	1.000	$44.99	$7,198	$8,324.40
	ELECT PANELS - 2/FL FOR 4 FLOORS	8	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$14,740	$1,300.00	1.475	1.000	$1,917.50	$15,340	$30,080.00
	RECEPT 4/RM,40RM/FL, FOR 4 FLOORS	640	EA	$8.85	1.00	1.10	1.000	$9.74	$6,230	$12.45	1.475	1.000	$18.36	$11,753	$17,983.20
	ADDITIONAL DATA OUTLET CABLES	120	CLF	$15.30	1.00	1.10	1.000	$16.83	$2,020	$48.00	1.475	1.000	$70.80	$8,496	$10,515.60
	ADDITIONAL DATA OUTLETS	120	EA	$2.20	1.00	1.10	1.000	$2.42	$290	$7.30	1.475	1.000	$10.77	$1,292	$1,582.50
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	5	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$8,388	$1,600.00	1.475	1.000	$2,360.00	$11,800	$20,187.50
	SCALES TOTAL														$129,436.50
	WATERBURY														
	COMM WIREMOLD -250FT/FL FOR 4 FLOORS	1000	FT	$5.25	1.00	1.10	1.000	$5.78	$5,775	$5.15	1.475	1.000	$7.60	$7,596	$13,371.25
	PWR WIREMOLD - 250FT/FL FOR 4 FLOORS	1000	FT	$5.25	1.00	1.10	1.000	$5.78	$5,775	$5.15	1.475	1.000	$7.60	$7,596	$13,371.25
	DATA CABLES - AVG 100FT/RM, 40RM/FL FOR 4	160	CLF	$15.30	1.00	1.10	1.000	$16.83	$2,693	$48.00	1.475	1.000	$70.80	$11,328	$14,020.80
	BRANCH CKT 1/RM,40RM/FL,4FL, AVG 100FT/CK	160	CLF	$6.40	1.00	1.10	1.000	$7.04	$1,126	$30.50	1.475	1.000	$44.99	$7,198	$8,324.40
	ELECT PANELS - 2/FL FOR 4 FLOORS	8	EA	$1,675.00	1.00	1.10	1.000	$1,842.50	$14,740	$1,300.00	1.475	1.000	$1,917.50	$15,340	$30,080.00
	RECEPT 4/RM,40RM/FL, FOR 4 FLOORS	640	EA	$8.85	1.00	1.10	1.000	$9.74	$6,230	$12.45	1.475	1.000	$18.36	$11,753	$17,983.20
	ADDITIONAL DATA OUTLET CABLES	120	CLF	$15.30	1.00	1.10	1.000	$16.83	$2,020	$48.00	1.475	1.000	$70.80	$8,496	$10,515.60
	ADDITIONAL DATA OUTLETS	120	EA	$2.20	1.00	1.10	1.000	$2.42	$290	$7.30	1.475	1.000	$10.77	$1,292	$1,582.50
	SWITCH/ROUTER FOR ADDITIONAL OUTLETS	5	EA	$1,525.00	1.00	1.10	1.000	$1,677.50	$8,388	$1,600.00	1.475	1.000	$2,360.00	$11,800	$20,187.50
	WATERBURY TOTAL														$129,436.50

Reference: RS**Means** Cost Data 2007

PAGE 5 TOTAL	**$258,873**
TOTAL FROM PAGE 4	**$1,480,566**
TOTAL	**$1,739,439**

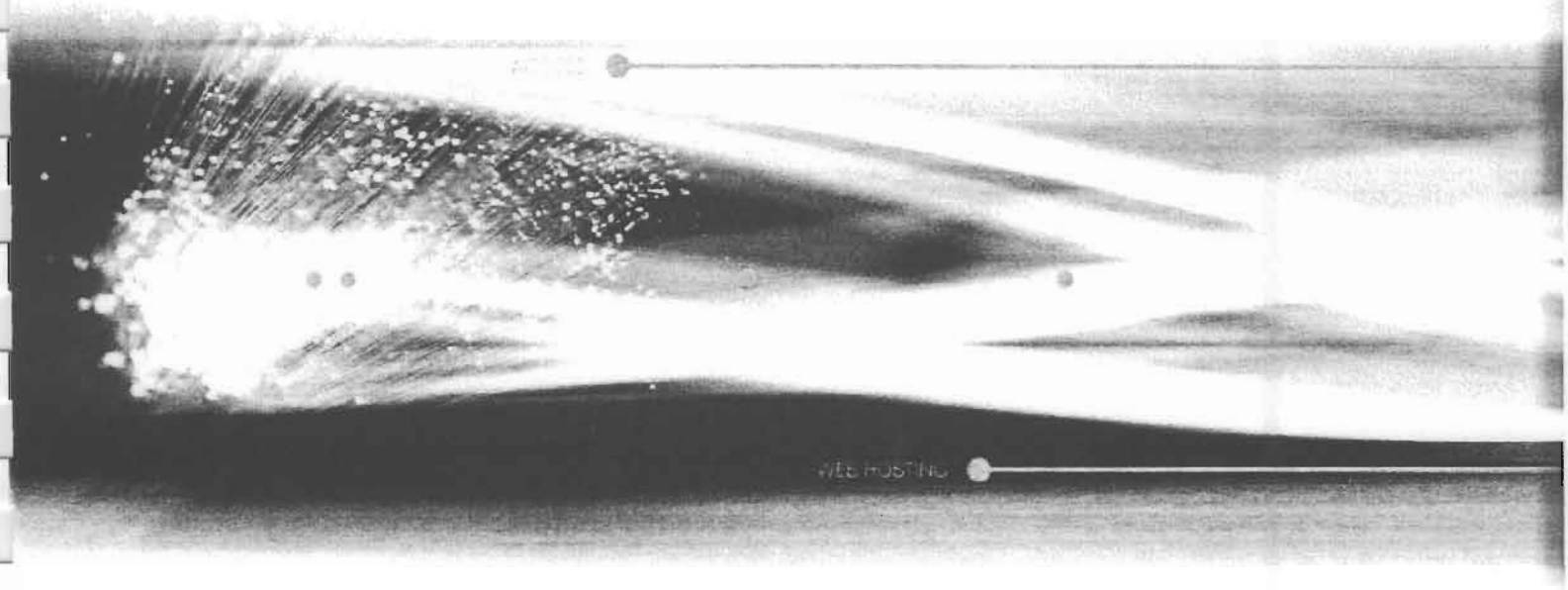
Appendix C

PROPOSAL

For: SUNY Oswego

Prepared for: Delta Engineers
184 Court St
Binghamton, NY 13901

SUNY Oswego Communications Study



TIME WARNER CABLE
Business Class

Contents

TIME WARNER CABLE
Business Class

May 4, 2007

Mr. Anthony Paniccia, JD, PE
President & CEO
Delta Engineers
184 Court St.
Binghamton, NY 13901

Re: SUNY Oswego Communications Study

Dear Anthony:

Time Warner Cable Business Class is pleased to submit the enclosed response to a request for information for SUNY OSWEGO. Our response demonstrates TWC's ability to provide network solutions that will enable SUNY OSWEGO to overcome its business challenges. The following pages provide detail about Time Warner Cable Business Class capabilities and customer support resources. An overview of the project team that will support you through the implementation of this solution is included as well.

Time Warner Cable Business Class is committed to providing SUNY OSWEGO with the products and services necessary to meet their current and future technology needs. Time Warner Cable Business Class is one of the world's largest digital video cable and broadband Internet service providers; our employees have considerable expertise and insight that will be instrumental in providing the correct solutions for a project of this importance.

Time Warner Cable Business Class primary point of contact for SUNY OSWEGO is:

Debra Bartlett
Account Executive
6005 Fair Lakes Rd.
East Syracuse, NY 13057
Phone – 315-634-6165
Fax – 315-234-5015
Email – debra.bartlett@twcable.com

Please do not hesitate to call if you have further questions.

Sincerely,

Debra Bartlett
Time Warner Cable Business Class

TIME WARNER CABLE
Business Class

Executive Summary

Time Warner Cable Business Class

Time Warner Cable Business Class, a department of TWC, is the nation's leading commercial cable broadband service provider. Its suite of broadband solutions enables its customers to capitalize use of the Internet by building an essential communication medium into a strategic business tool.

Since 1998, Time Warner Cable Business Class has been providing solutions to customers using a combination of fiber-optic national and regional networks throughout TWC's hybrid fiber-coaxial (HFC) infrastructure. RRBC services are primarily offered through TWC systems, although select Brighthouse systems also provide services to several markets.

The TWC Broadband division employs over 1,000 employees nationwide and operates numerous Regional Data Centers. Regional corporate offices are located in Herndon, VA and Charlotte, NC. The Herndon office houses a technically sophisticated Network Operations Center, Quality Assurance networks and many engineering labs. Engineering and Support Services are located in Charlotte, NC.

About Time Warner Cable

TWC is a true pioneer in the cable industry. Today, TWC owns and manages the most advanced, best-clustered cable television operations in the country as a result of careful planning and acquisitions in its infancy.

The following information provides statistical and demographic information:

- The Syracuse Division of Time Warner Cable (serving 861,000+ customers) is owned by a partnership, Time Warner Entertainment - Advance/Newhouse (TWE-AN). Corporate offices for Time Warner Cable are in Stamford, Connecticut. The company trades on the NYSE, ticker "TWX."

- Time Warner Cable, a subsidiary of Time Warner Inc, is the second largest MSO in the US and awarded highest ranking for customer satisfaction in 2002. Its footprint consists of 46 Divisions that serve 12.9M subscribers. Time Warner Cable provides and supports high speed Internet services to well over 228,000+ residential customers in CNY. In addition, Time Warner Cable provides support to 11,000+ business class customer in CNY. We are able to offer a full suite of scalable, integrated products specifically developed to meet the needs of today's businesses.

- Time Warner Cable was formed in 1989 through the merger of Time Inc.'s cable television company, American Television and Communications Corporation, and Warner Cable, a division of Warner Communications. The company has 31 operating divisions, employs 30,000 professionals across the U.S. and has corporate headquarters in Stamford, CT and Charlotte, NC.

- The Time Warner Cable network is CISCO Powered and 100% owned and operated by Time Warner Cable.

- Time Warner Provides Managed Service Customers with priority 24x7x365 service and support.

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Overview of Services

Time Warner Cable (TWC) is submitting the following to be included in the Delta Engineers Communication Study to be provided to SUNY Oswego.

Time Warner Cable will rewire SUNY Oswego Campus dormitories for a cost of $339,000 to support and provide video services for the duration of the existing Commercial Video Services Agreement. This rewire will also support Road Runner high speed data internet service to each of the 4,177 students residing in the dormitories.

The $339,000 cost includes complete project implementation by TWC. If SUNY Oswego elects to have a contractor of their choice, who is pulling their electrical wiring, to rewire in lieu of TWC, the price can be reduced substantially.

Dorms Included

Hall	Rooms	Lounges	Total Beds	Floors	Beds Per Floor	Nodes Needed
Cayuga	248	9	504	4	150	4
Funnelle	234	19	450	10	50	4
Hart	176	18	405	10	50	4
Johnson	116	25	236	4	65	2
Mackin	142	2	142	3	49	1
Oneida	233	4	495	4	138	4
Onondaga	323	128	624	10	60	4
Scales	109	1	218	4	120	2
Seneca	323	20	659	10	168	4
Waterbury	109	1	211	4	60	2
Riggs	116	24	232	4	?	2
Shady Shores	Pres. Home		1	1	1	1
Totals	**2129**	**251**	**4177**	**68**		**34**

TIME WARNER CABLE
Business Class

Overview of Services

Time Warner Cable (TWC) will provide Road Runner High Speed Data internet services for each on-campus student.

Time Warner Cable will:

- install a CMTS (Cable Modem Termination System) at SUNY Oswego
- install cable modems to provide service to the 4,177 students residing in the dormitories
- provide internet access through or CMTS (Universal Broadband Router) out to the internet
- provide students with a quality high speed data service that will enhance and satisfy the resident students on-campus experience
- provide today's student residents with media options which they are accustomed to having at home.

Cable modem service will be configured for:

- an upstream speed of 512 Kbps by 3 Mbps downstream for single rooms
- an upstream speed of 768 Kbps by 4 Mbps downstream for double rooms
- an upstream speed of 1.5 Mbps by 6 Mbps downstream for triple rooms
- an upstream speed of 2 Mbps by 10 Mbps downstream for quad rooms

Students may easily download the latest version of Road Runner's virus protection, firewall and spam blocker to protect their personal computers.

TWC will provide **24/7 end user support** for the Road Runner University product

TIME WARNER CABLE
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Bulk Road Runner High Speed Data Internet Service

Price per Student per Month	Term
$6.75	5 year
$5.85	7 year
$5.00	10 year

Price is based on 12 month billing

Digital Phone Service

If SUNY Oswego decides to contract with TWC to provide Road Runner high speed data internet service, TWC could also provide digital phone service directly to the students on an individual basis for $29.95 per month.

TIME WARNER CABLE
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Why Time Warner Cable?

Time Warner Cable's advantages include:

- Has a significant local presence in both business and charitable work throughout Central New York. Only potential provider to have a local customer and technical services office, as well as a Division headquarters in the greater Syracuse area. Demonstrated responsiveness and commitment to twenty (20) College's/University's providing cable television services and now Road Runner services as well as Fiber for Data services.

- Is the only potential provider to operate local news channel – News10Now, and local sports channel – Time Warner Sports, showing commitment to Central New York and its communities.

- Provides second to none digital video services including premium channels, video on demand, pay per view, digital video recorders, and promotional packages exclusively for colleges. Carries more HDTV channels than any other provider at a fraction of the price.

- The second largest cable operator in the country with the ability to negotiate with programmers, securing the best possible rates and programming packages.

- Has a long successful history in providing video services to the college/university community.

- Provides "one stop shop" capability to the College for video & data.

- Alleviates the need for 24X7 student support and maintenance and monitoring of Internet access services by College IT staff.

- Students may easily download the latest version of Road Runner's virus protection, firewall and add blocker to protect their personal computers.

- Time Warner Business services will provide a range of IP addresses for student's to aggregate into the campus network avoiding going out to the internet for access to campus data services. This will provide the College or University control on students accessing campus resources.

- Invests significant resources, both equipment and personnel, to ensure its state of the art hybrid-fiber-coax network and internet backbone are highly reliable and resilient to both man-made and weather elements.

- Is willing to invest significant resources in upgrading the Colleges node infrastructure, enabling both bulk video and data services.

A commitment to partnering with SUNY Oswego to ensure the video and communications services provided on campus meet and exceed expectations, and the service and support provided remains superior.

TIME WARNER CABLE
Business Class

References

Time Warner Cable provides and supports High Speed Internet Service to over 228,000+ residential customers in CNY. In addition, Time Warner Cable Business Class provides and supports 11,000+ Time Warner Cable Business Class customers. We are able to offer a full suite of scalable, integrated products specifically developed to meet the needs of today's businesses – from a one person home office worker to national accounts

Time Warner Cable provides and supports video services to over 20 universities throughout the Syracuse Division. In addition, Time Warner Cable Business Class provides and supports 3 universities with bulk Road Runner high speed data internet services

Our higher end customers with fiber connections include hospitals, schools, universities and a variety of businesses throughout CNY. Our Dedicated Access solutions scale from 3Mbps to 1Gbps and can be customized to meet any business needs. For example, Point to Point connectivity (with or without internet access) – providing dedicated interconnectivity between two facilities. Point to Multipoint connectivity (with or without internet access) – providing high capacity connections between multiple offices and Internet access – providing high speed internet access.

Time Warner Cable Business Class owns monitors and supports a Hybrid Fiber Coax network, ensuring reliable and secure operations. Time Warner Cable is continually expanding its network infrastructure as it continues to add services within its footprint.

Below are references for your review-any one of these current customers would be willing to talk with you to discuss our service and support:

Customer:	SUNY Potsdam
Service Provided:	Bulk Road Runner Services
Contact:	Andy Haradine
Phone Number:	315-212-056

Customer:	SUNY Canton
Service Provided:	Bulk Road Runner Services
Contact:	Courtney Battista
Phone Number:	315-212-1724

Customer:	Tompkins Cortland Community College
Service Provided:	20 Mbps - Dedicated Internet
Contact:	Mr. Marty Christofferson
Phone Number:	607-844-8211 x4308

THE STATE UNIVERSITY OF NEW YORK
Potsdam

April 14, 2007

Deb Bartlett
Time Warner Cable Business Class
Commercial Account Executive
6005 Fair Lakes Road
East Syracuse, NY 13057

Dear Deb,

Time Warner Cable Business Class has been providing SUNY Potsdam with complete residential and academic cable TV services as well as residential Road Runner high-speed internet service since August 2004. From the time we signed the contract to the opening of school, Time Warner had only two short months to: upgrade our existing cable TV coax plant; to pull and terminate new fiber to all of our 35 buildings; to install head-end equipment; to create the cable lineup; to procure and install 1800 cable modems; to create support and marketing materials. We were nervous to say the least that all of this could be accomplished in time. Kudos went out to Time Warner and their excellent team of engineers, technicians, sales and support professionals as they pulled it off. During that fall's opening weekend, Time Warner had far more techs on-site stationed in our college union than they needed. We mutually decided to cut that number back to one tech and one customer service representative stationed on-site opening weekend each subsequent year due to the lack of cable TV and Road Runner problems.

As we are nearing the end of our third full year using Time Warner services, I am extremely pleased to report there have been very, very few problems. Prior to sub-contracting our residential internet service, I would typically receive a dozen or so escalated student internet related complaints a week. Three years into our agreement with Time Warner, I've received less than ten complaints altogether. Time Warner promised they could deliver the bandwidth and they have. Several Potsdam technical staff including yours truly have been issued business customer portal accounts enabling us to check past and present bandwidth usage. Time Warner is providing the bandwidth and a level of service we could have only hoped to more especially 24x365 tech support. When students arrive in their rooms they receive a Time Warner welcome kit which includes antivirus/firewall download instructions but more importantly troubleshooting and support telephone numbers. Time Warner also affixed a label to each room's cable modem with the same support telephone numbers. A student being able to call and get help beyond the hours where our local helpdesk is open (M-F 8am-4:30pm) is undoubtedly the best benefit and pays homage to why we just don't get complaints.

The residential population of SUNY Potsdam has increased and outpaced enrollment growth each year since the university contracted with Time Warner Business Class for cable TV and internet. I truly believe this is not a coincidence. Potsdam constructed five new residential townhouse units which opened this past summer and also recently broke ground for a second set of five townhouse units slated to open fall 08'. Time Warner engineers and technicians did an outstanding job designing, installing, and annexing the first townhouse complex to their existing system. I'm confident the second set's annexation will go just as smoothly.

Computing and Technology Services • Phone: (315) 267-2089 • Fax: (315) 267-3169
44 Pierrepont Avenue • Potsdam, New York 13676-2294 • www.potsdam.edu

THE STATE UNIVERSITY OF NEW YORK

Potsdam

SUNY Potsdam views Time Warner as a partner. Our technical and residence life staff members hold an annual meeting with Time Warner technical, sales, and management team to: review opening weekend staffing; to select dates for testing modems and cable signal strength; to update our marketing flyers and cable lineup; to review and update all our internal and external support procedures. Although I haven't had to do so, it's a nice feeling knowing if something were to go awry, I can pick up the phone and call on a Time Warner staffer who I know personally and rest assuredly can count on. The same goes for system and service additions, changes and deletions. I just email or call Time Warner's Alisa and she takes care of all the details. If only everything were so simple.

In summary, the services Time Warner Business Class's provides on behalf SUNY Potsdam have proven a tremendous success. It is without reservation I recommend Time Warner Business Class and their tireless team of professionals to you. Please feel free to email me if you have any questions.

Sincerely,

Andy Harradine

Andy Harradine
Assistant VP for Information Technology
Computing and Technology Services
State University of New York at Potsdam
44 Pierrepont Ave
Potsdam, NY 13667
Email: andy@potsdam.edu

SUNY CANTON

DIVISION OF STUDENT AFFAIRS

State University of New York • 34 Cornell Dr. • Canton, NY 13617-1096 • www.canton.edu

DEPARTMENT OF RESIDENCE LIFE
OFFICE: 315-386-7513
FAX: 315-386-7969
reslife@canton.edu

April 16, 2007

To Whom It May Concern:

In the winter of 2005, SUNY Canton worked closely with Time Warner Cable to procure Road Runner services for each of our 422 residence hall rooms on campus. This project came to fruition in December of 2005, when the Time Warner staff worked diligently over our winter break to get the internet service installed in each residence hall room.

The experience was certainly a pleasant one, both for staff and students. The installation team worked quickly and with great expertise, and completed the project almost two weeks before the date we were told the project would be finished on. I was very impressed by the long hours they worked, and the positive attitudes they displayed, all while working right around the holiday season.

The Time Warner executive staff was also a pleasure to work with. Alisa Meccarielli-Leo and other members of her team made this a painless process. Their tireless energy and commitment to working with SUNY Canton made the project a success. We couldn't have done it without them!

The students are very pleased with the internet service they are receiving in the residence halls now, well over a year later, as well as the customer service support. There has not yet been an issue that Alisa and her staff have not been quick to handle, and the Road Runner technical support team has worked with our students to resolve any issues they have had. Thankfully, we have had no major issues at this point, but I am confidant that if we did, Time Warner would have fixed them quickly and with a great spirit of customer service.

In short, I feel it was the right decision for us to switch to Time Warner Road Runner internet service for our campus. The students are pleased, and I have been thrilled with the level of service provided. I hope to continue working positively with them in the future.

Sincerely,

Courtney D. Battista

Courtney D. Battista
Director of Residential Life

TIME WARNER CABLE
Business Class

Contact Information/Key Personnel

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Appendix D

APPENDIX D

SUNY OSWEGO
FIBER NETWORK UPGRADE PROJECT

ASBESTOS MATERIAL IMPACT
AND
ABATEMENT COST ESTIMATE

EXECUTIVE SUMMARY

The following information is for the eleven buildings included in the SUNY Oswego Fiber Network Upgrade Project and is associated with the potential impact the project will have on the existing asbestos containing material's (ACM's) present at building. The information presented here is based on asbestos-related documentation and information provided by the University in the form of a Pre-Renovation Asbestos Survey report. The survey report, dated February 2007, was prepared by Watts Architecture and Engineering specifically for the SUNY Oswego Fire Alarm Replacement Project. It should be noted that a site visit and visual inspection of the suspect building materials present at each structure was not performed for the preparation of this section of the report as it was not includes in Delta's scope of work.

The Watts report is based on a combination of data obtained through material sampling performed by Watts in 2006 as well as existing sample results apparently provided to them by the University for material sampling performed over the period of 1987 through 2006. No specific reference is made in the Watts Report as to the source of the 1987 – 2006 sample / material data.

Several inherent limitations were faced in using ONLY the Watts Report as a basis for this Asbestos Material Impact and Abatement Cost Estimate. These included the following:

1) Although the Watts Report lists the asbestos containing materials present for eight of the eleven buildings included in the Fiber Network Upgrade Project, there are no material quantities or locations for the included ACM's. For three of the buildings (Cooper, Pathfinder and Littlepage Dining Halls), there is no information available.

2) When reviewing the Watts sampling / results and the sample results included for the 1987 through 2006 sampling, the same material (i.e. ceiling plaster) appears to have been sampled numerous times over the course of the 20 year period. The information provided for the given material is limited and this is further complicated by the fact that a material was found to be reported as an ACM in one instance and as a non-ACM in other areas of the report.

3) Without performing an actual site visit, it was impossible to verify the exact locations of the various ACM's referenced in the Watts Report. It is also impossible to verify / refute the presence of other suspect building materials they may not have been included or addressed in the previous surveys included in the Report.

Based on the above, for the purposes of this Report, if a given material was identified as being asbestos-containing, unless a specific location or quantity was included for that material, it was assumed to be present throughout the entire building at all locations of impact, even if other non-asbestos results for the same material were provided in the report. An example of this can be seen in the information provided for Seneca Hall. Numerous results are included for "ceiling plaster", with some listed as positive and others listed as negative for asbestos. As the information provided with each sample results is insufficient to determine the specific location of the asbestos vs. the non-

asbestos plaster in the building, the worst-case scenario was assumed for the purposes of this Report and all ceiling surfaces within the given building were assumed to be finished with asbestos containing plaster.

As such, the asbestos material information and associated cost estimates provided here should only be considered very "general". As per the requirements of the New York State Department of Labor Code Rule 56 (cited as 12 NYCRR Part 56), a Pre-Renovation Survey must be performed for each specific renovation project and must address the spaces and suspect building materials included in the renovation limits / scope. Although the Code Rule does allow the use of historical data, a complete and comprehensive pre-renovation survey of each building should be performed and include a visual inspection of each building space to identify, locate and quantify any suspect building material or previously identified asbestos material that has the potential to be impacted by the Fiber Network Upgrade Project.

I) MACKIN DINING HALL: Basement, Ground Floor and 1st through 3rd Floors

1) Existing Asbestos Survey Information

A. From Watts Survey –

Asbestos-Containing Materials (ACM)

- NONE

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Various Floor Tile and associated Mastics
- Pipe / Pipe Fitting Insulation
- Transite Ceiling Tile - identified in dishwashing room through 1994 survey
- Interior Wall Insulation - identified in main dining room through 1998 survey
- Duct Insulation

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe / Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

B) Transite Ceiling Panels – The only location where this material is referenced in the provided "past survey documentation / information" is the Dishwashing Area. If this is the case, then this material could most likely be avoided in this area. If the transite ceiling panels are present in other areas, then the material does have the potential to be impacted during coring operations and/or the installation of surface raceway systems.

C) Interior Wall Insulation – The only location where this material is referenced in the provided "past survey documentation / information" is the Main Dining Room. If this is the case, then this material would only be impacted during wall coring operations necessary to install telecom and power feeds from the main hallway raceway into the Main Dining Room Space. If the interior insulation is present in all wall cavities throughout the entire building, then it would be impacted at all locations where wall cores are required to run feed branches from the main hallway raceway to each individual room / space.

D) Insulated Wiring – Although sample results from the Watts Engineering Pre-Renovation Asbestos Survey Report listed the cloth wire insulation as non-asbestos, University personnel informed Delta Engineers that this material is asbestos-containing in certain areas of the building. As no information regarding specific locations or quantities of this ACM were

provided, the impact to this material cannot be determined at the present time.

I) MACKIN DINING HALL (CONT'D):

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:
- Materials could most likely be avoided
- No abatement costs anticipated

B) Transite Ceiling Panels:
- Material assumed only to be present in the Dishwashing Area
- Avoid coring or mounting of raceway to ceiling surface
- No abatement costs anticipated

C) Interior Wall Insulation –
- Material assumed only to be present in the Main Dining Hall interstitial wall spaces
- Assumed 4 wall cores required for telecom and power feed branches to space
- 8 "minor" tent work areas (1 tent on each side of wall at 4 core locations)
  - Minor Project Mobilization - **$500**
  - 8 tents @ $250 each = **$2,000**

D) Insulated Wiring:
- As no information regarding quantity or location of asbestos containing wire insulation is available, a Contingency of **$5,000** is being included to address the potential abatement of this material.

Total Mackin Dining Hall Asbestos Abatement Estimate - $7,500

II) FUNNELLE HALL: Basement and 1st through 9th Floors

1) Asbestos Survey Information

A. From Watts Survey –

Asbestos-Containing Materials (ACM)

- 1' x 1' Ceiling Tile

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Various Floor Tile
- Pipe / Pipe Fitting Insulation
- 2' x 2' Transite Ceiling Tile: identified in Basement Elevator Lobby
- Fire Doors

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe / Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

B) Transite Ceiling Panels – The only location where this material is referenced in the provided "past survey documentation / information" is the Basement in the hallway adjacent to the elevators. If this is the case, then this material could most likely be avoided in this area. If the transite ceiling panels are present in other areas, then the material does have the potential to be impacted during coring operations and/or the installation of surface raceway systems.

C) 1' x 1' Ceiling Tile – This asbestos containing ceiling material is referenced in the provided "past survey documentation / information" as being present in the 1st Floor Lobby and only in the Lounges on floors 2 through 9. It should be noted that it was only found to be asbestos-containing in the 9th floor lounge sample. Samples of this material collected from the Lobby, 2nd, 6th and 8th floor lounges were reported as None Detected but as it is being considered a "homogenous material" for the entire building, the one positive result was used to classify it all as an ACM. If this tile is only present on the lounge of each floor and in the Lobby on the main floor, then this material would only be impacted if raceway is installed on the ceilings in these rooms.

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:

- Materials could most likely be avoided

- No abatement costs anticipated

II) FUNNELLE HALL (CONT'D):

B) Transite Ceiling Panels:

- Material assumed only to be present in the Basement
- Avoid coring or mounting of raceway to ceiling surface if possible
- Assume minimum four raceway cross-over runs required on basement ceiling
- 4 "minor" tent work areas
    - Minor Project Mobilization - **$500**
    - 4 tents @ $250 each = **$1,000**

C) 1' x 1' Ceiling Tile:

- Material assumed only to be present in Main Lobby and Lounges on floor 2 - 9
- Assume minimum four raceway cross-over runs required on Lobby ceiling
- Assume minimum two raceway ceiling runs required in each Lounge
- Minor Project Mobilization, assume 1 for every 2 floors
    - $500 per set-up, 1 for every 2 floors, 9 floors total = **$2,500**
- 20 "minor" tent work areas
    - 20 tents @ $250 each = **$5,000**

Total Funnelle Hall Asbestos Abatement Estimate - $9,000

III) SENECA HALL: Basement, 1st through 10th Floors

1) Asbestos Survey Information

A. From Watts Survey –

Asbestos-Containing Materials (ACM)

- NONE

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Various Floor Tiles
- Pipe Fitting Insulation
- Ceiling Finishes including:
  - the majority of ceiling plasters
  - ceiling tile mastic
- Wall Finishes including:
  - wall board & plaster systems
  - drywall and joint compound systems
- Transite Ceilings and Window Panels

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe Fitting Insulation - This material could most likely be avoided but is referenced here as it does have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

B) All Ceiling Surfaces – "Past survey documentation / information" identifies various ceiling plasters, ceiling tile mastics and transite panels as being asbestos containing. They also reference various ceiling plasters and tile mastics as non-asbestos. As specific locations for the asbestos vs. non-asbestos ceiling finishes are not provided in the supplied past survey documentation / information, all ceiling surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

C) All Wall Surfaces – "Past survey documentation / information" identifies various wall boards, wall plasters, drywall and joint compounds as being asbestos containing. They also reference various wall boards, wall plasters, drywall and joint compounds as non-asbestos. As specific locations for the asbestos vs. non-asbestos wall finishes are not provided in the supplied past survey documentation / information, all wall surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

III) SENECA HALL (CONT'D):

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:

- Materials could most likely be avoided
- No abatement costs anticipated

B) Ceiling Surfaces and Wall Surfaces:

- All ceiling materials assumed to be asbestos containing
- All wall materials assumed to be asbestos containing
- Basement raceway runs assumed to be 10% of typical upper floor
- Abatement costs
  - Large Project Mobilization, assume 1 for every 2 floors
    - $1,500 per set-up, 1 for every 2 floors, 11 floors total = **$9,000**
  - Ceiling / Wall Surface Abatement and Cores
    - 430 linear feet (lf) for hall main raceway runs per floor = 4,400 lf
    - 30 lf per room for branches, avg. 40 rooms per floor = 12,200 lf
    - 16,600 lf @ 1' wide abatement = 16,600 sf
    - 16,600 sf @ $15.00 per sf = **$249,000**

Total Seneca Hall Asbestos Abatement Estimate - $258,000

IV) CAYUGA HALL: Basement, 1st through 4th Floors

1) Asbestos Survey Information

A. From Watts Survey –

Asbestos-Containing Materials (ACM)

- NONE

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Drywall Joint Compound
- Various Floor Tile and mastics
- Cove Base Mastic
- Pipe / Pipe Fitting Insulation
- Acoustical Ceiling Plaster
- Transite Ceilings
- Elevator Hoistway Door Packing

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe / Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

B) All Ceiling Surfaces – "Past survey documentation / information" identifies various ceiling plasters, and transite panels as being asbestos containing. They also reference various ceiling plasters as non-asbestos. As specific locations for the asbestos vs. non-asbestos ceiling finishes are not provided in the supplied past survey documentation / information, all ceiling surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

C) All Wall Surfaces – "Past survey documentation / information" identifies various wall boards, wall plasters, and joint compounds as being asbestos containing. They also reference various wall boards, wall plasters, drywall and joint compounds as non-asbestos. As specific locations for the asbestos vs. non-asbestos wall finishes are not provided in the supplied past survey documentation / information, all wall surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

IV) CAYUGA HALL (CONT'D):

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:

- Materials could most likely be avoided
- No abatement costs anticipated

B) Ceiling Surfaces and Wall Surfaces:

- All ceiling materials assumed to be asbestos containing
- All wall materials assumed to be asbestos containing
- Basement raceway runs assumed to be 10% of floors 1-4
- Abatement costs
    - Large Project Mobilization, assume 1 for every 2 floors
        - $1,500 per set-up, 1 for every 2 floors, 5 floors total = **$4,500**
    - Ceiling / Wall Surface Abatement and Cores
        - 510 linear feet (lf) for hall main raceway runs per floor = 2,090 lf
        - 35 lf per room for branches, avg. 96 rooms per floor = 13,800 lf
        - 15,900 lf @ 1' wide abatement = 15,900 sf
        - 15,900 sf @ $15.00 per sf = **$238,500**

Total Cayuga Hall Asbestos Abatement Estimate - $243,000

V) ONONDAGA HALL: Basement, 1st through 10th Floors

1) Asbestos Survey Information

A. From Watts Report –

Asbestos-Containing Materials (ACM)

- Ceiling Plaster

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Various 9" x 9" Floor Tiles
- Pipe Fitting Insulation
- Drywall Joint Compound systems
- Transite Ceilings and window panels

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

B) All Ceiling Surfaces – "Past survey documentation / information" identifies various acoustical ceiling plasters as being asbestos containing. They also reference various ceiling plasters as non-asbestos. As specific locations for the asbestos vs. non-asbestos ceiling finishes are not provided in the supplied past survey documentation / information, all ceiling surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

C) All Wall Surfaces – "Past survey documentation / information" identifies various drywall and joint compounds as being asbestos containing. They also reference various wall boards, wall plasters, drywall and joint compounds as non-asbestos. As specific locations for the asbestos vs. non-asbestos wall finishes are not provided in the supplied past survey documentation / information, all wall surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:

- Materials could most likely be avoided
- No abatement Costs Anticipated

V) ONONDAGA HALL (CONT'D):

B) Ceiling Surfaces and Wall Surfaces:

- All ceiling materials assumed to be asbestos containing
- All wall materials assumed to be asbestos containing
- Basement raceway runs assumed to be 10% of typical upper floor
- Abatement costs
    - Large Project Mobilization, assume 1 for every 2 floors
        - $1,500 per set-up, 1 for every 2 floors, 11 floors total = **$9,000**
    - Ceiling / Wall Surface Abatement and Cores
        - 632 linear feet (lf) for hall main raceway runs per floor = 6,400 lf
        - 30 lf per room for branches, avg. 50 rooms per floor = 15,200 lf
        - 21,600 lf @ 1' wide abatement = 21,600 sf
        - 21,600 sf @ $15.00 per sf = **$324,000**

Total Onondaga Hall Asbestos Abatement Estimate - $333,000

VI) ONEIDA HALL: Basement, 1st through 4th Floors

1) Asbestos Survey Information

A. From Watts Report –

Asbestos-Containing Materials (ACM)
- Acoustic Ceiling Plaster
- Ceramic Wall Tile Thin Set

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials
- Various Floor Tile and mastics
- Pipe / Pipe Fitting Insulation
- Transite Ceilings
- Wall Mastic (Basement only)

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe / Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

B) All Ceiling Surfaces – "Past survey documentation / information" identifies various ceiling plasters, transite panels as being asbestos containing. They also reference various ceiling plasters as non-asbestos. As specific locations for the asbestos vs. non-asbestos ceiling finishes are not provided in the supplied past survey documentation / information, all ceiling surfaces to be impacted by the coring operations and/or surface raceway system installation are assumed to be asbestos containing for the purposes of this study.

C) Basement Wall Mastic – "Past survey documentation / information" identify this material in the basement only and it could most likely be avoided but is referenced here as it does have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:
- Materials could most likely be avoided
- No abatement costs anticipated

B) Ceiling Surfaces:
- All ceiling materials assumed to be asbestos containing

- Basement raceway runs assumed to be 10% of floors 1-4

VI) ONEIDA HALL (CONT'D):

- As wall materials are non-asbestos, assume 50% of raceway can be installed on wall and 50% on ceiling.
- Abatement costs
    - Large Project Mobilization, assume 1 for every 2 floors
        - $1,500 per set-up, 1 for every 2 floors, 5 floors total = **$4,500**
    - Ceiling Surface Abatement and Cores
        - 255 linear feet (lf) for hall main raceway runs per floor = 2,090 lf
        - 17 lf per room, avg. 96 rooms per floor = 6,700 lf
        - 8,800 lf @ 1' wide abatement = 8,800 sf
        - 8,800 sf @ $15.00 per sf = **$132,000**

C) Basement Wall Mastic:

- Material could most likely be avoided
- No abatement costs anticipated

Total Oneida Hall Asbestos Abatement Estimate - $136,500

VII) SCALES HALL: Basement and 1st through 3rd Floors

1) Asbestos Survey Information

A. From Watts Report –

Asbestos-Containing Materials (ACM)

- NONE

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Various Floor Tile and associated mastics
- Pipe / Pipe Fitting Insulation

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe / Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:

- Materials could most likely be avoided
- No abatement costs anticipated

Based on the available survey information, it appears that no asbestos materials present at Scales Hall will be impacted by the Telecommunications Project.

VIII) WATERBURY HALL: Basement and 1st through 3rd Floors

1) Asbestos Survey Information

A. From Watts Report –

Asbestos-Containing Materials (ACM)

- NONE

B. From previous sampling information included in Watts Survey Report –

Asbestos-Containing Materials

- Various Floor Tile and associated mastics
- Pipe / Pipe Fitting Insulation

2) Potential ACM Impact from Telecommunications Project - The asbestos-containing materials listed above which have the potential to be impacted by the Telecom project include:

A) Pipe / Pipe Fitting Insulation - These materials could most likely be avoided but are referenced here as they do have the potential to be impacted during the installation of surface raceway systems (communication system and power system).

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:

- Materials could most likely be avoided
- No abatement costs anticipated

Based on the available survey information, it appears that no asbestos materials present at Waterbury Hall will be impacted by the Telecommunications Project.

IX) COOPER DINING HALL: Ground Floor and 1st Floor

1) Asbestos Survey Information – At the time this study was prepared, there was no "Past survey documentation / information" or other historical data listing asbestos containing materials present at the Cooper Dining hall available. As such, for the purposes of this report, all wall and ceiling surfaces are being assumed to be asbestos containing.

2) Potential ACM Impact from Telecommunications Project – As no information associated with the asbestos-containing materials present at the Cooper Dining Hall was available, all wall and ceiling surfaces to be impacted by the Telecom project are assumed to be asbestos containing.

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:
- If present, materials could most likely be avoided
- No abatement costs anticipated

B) Ceiling Surfaces and Wall Surfaces:
- All ceiling materials assumed to be asbestos containing
- All wall materials assumed to be asbestos containing
- Abatement costs
  - Large Project Mobilization,
    - $1,500 per set-up, 1 set-up per floor = **$3,000**
  - Ceiling / Wall Surface Abatement and Cores
    - 150 linear feet (lf) for hall main raceway runs per floor = 300 lf
    - avg. 100 lf per floor for room feeds = 200 lf
    - 500 lf @ 1' wide abatement = 500 sf
    - 500 sf @ $15.00 per sf = **$7,500**

Total Cooper Dining Hall Asbestos Abatement Estimate - $10,500

X) PATHFINDER DINING HALL: Ground Floor and 1st Floor

1) Asbestos Survey Information – At the time this study was prepared, there was no "Past survey documentation / information" or other historical data listing asbestos containing materials present at the Pathfinder Dining Hall available. As such, for the purposes of this report, all wall and ceiling surfaces are being assumed to be asbestos containing.

2) Potential ACM Impact from Telecommunications Project – As no information associated with the asbestos-containing materials present at the Pathfinder Dining Hall was available, all wall and ceiling surfaces to be impacted by the Telecom project are assumed to be asbestos containing.

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:
- If present, materials could most likely be avoided
- No abatement costs anticipated

B) Ceiling Surfaces and Wall Surfaces:
- All ceiling materials assumed to be asbestos containing
- All wall materials assumed to be asbestos containing
- Abatement costs
  - Large Project Mobilization,
    - $1,500 per set-up, 1 set-up per floor = **$3,000**
  - Ceiling / Wall Surface Abatement and Cores
    - 175 linear feet (lf) for hall main raceway runs per floor = 350 lf
    - avg. 100 lf per floor for room feeds = 200 lf
    - 550 lf @ 1' wide abatement = 550 sf
    - 550 sf @ $15.00 per sf = **$8,250**

Total Pathfinder Dining Hall Asbestos Abatement Estimate - $11,250

XI) LITTLEPAGE DINING HALL: Ground Floor and 1st Floor

1) Asbestos Survey Information – At the time this study was prepared, there was no "Past survey documentation / information" or other historical data listing asbestos containing materials present at the Littlepage Dining Hall available. As such, for the purposes of this report, all wall and ceiling surfaces are being assumed to be asbestos containing.

2) Potential ACM Impact from Telecommunications Project – As no information associated with the asbestos-containing materials present at the Litlepage Dining Hall was available, all wall and ceiling surfaces to be impacted by the Telecom project are assumed to be asbestos containing.

3) Asbestos Abatement Cost Estimate

A) Pipe / Pipe Fitting Insulation:
- If present, materials could most likely be avoided
- No abatement costs anticipated

B) Ceiling Surfaces and Wall Surfaces:
- All ceiling materials assumed to be asbestos containing
- All wall materials assumed to be asbestos containing
- Abatement costs
  - Large Project Mobilization,
    - $1,500 per set-up, 1 set-up per floor = **$3,000**
  - Ceiling / Wall Surface Abatement and Cores
    - 175 linear feet (lf) for hall main raceway runs per floor = 350 lf
    - avg. 100 lf per floor for room feeds = 200 lf
    - 550 lf @ 1' wide abatement = 550 sf
    - 550 sf @ $15.00 per sf = **$8,250**

Total Littlepage Dining Hall Asbestos Abatement Estimate - $11,250