TECHNICAL DESIGN SERVICES, INC.

TDSi

COMPANY PROFILE

TECHNICAL DESIGN SERVICES, INC.
1075 SHORE ROAD
NAPERVILLE, IL 60563
630.983.9906

TDSi TECHNICAL DESIGN SERVICES, INC.
Telecommunications / Network Infrastructure Design & Consulting

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COMPANY PROFILE

Technical Design Services, Inc. (TDS*i*) is located in Naperville, Illinois and was incorporated in 1999 with the mission of providing design and engineering services for clients with needs in the areas of Structured Cable Design, Audio-Visual Design, Electronic Security System Design and CAD services. In 2001, anticipating the growth of voice and data network convergence, TDS*i* expanded to include an Enterprise Communications Consulting practice, providing integrated Networking and Telecommunications consulting. As Enterprise Communications Consulting evolved, TDS*i* added consulting capabilities for information technology governance, including Security Assessments, Project Management and Strategic Planning.

TDS*i* has conducted many successful consulting engagements, both locally and across the nation, by providing professional quality and value added services in a timely manner. TDS*i* works closely with clients to develop high performance and cost effective solutions that meet current and future client needs. TDS*i* hires highly motivated and experienced consultants and fosters a creative work environment for its employees. TDS*i* encourages its consultants to be flexible and to provide objective consulting services that work toward the client's technical and business goals.

CONSULTING SERVICES

Audio/Visual Systems Design and Consulting: TDS*i* also provides Audio/Visual Systems Design and Consulting. We have designed systems in a number of different environments. Our Audio/Visual Systems Design and Consulting Services typically include:

- Audio Visual System Design, Specification and Request For Proposal (RFP) Development
- Training and Educational Technology Integration, Multimedia Conference Rooms Training/Classrooms/EOC's and NOC's, Multimedia Projection Systems
- MATV/CATV Systems Distribution Design and Consulting
- Video Conference Room systems
- Drop Down Screens, Presentation system monitors
- Audi lift and microphone systems
- Simulation systems including cameras, screens and recording systems for demonstrations
- Wired and Wireless operations of multimedia systems.

Electronic Security System Design and Consulting: TDS*i* also provides Electronic Security Systems Consulting. Our consultants have designed systems for small libraries to 400,000 sf. office spaces, as well as having included control and monitoring of large data centers and computer rooms. Our electronic security system designs include:

- Access/entry control
- Intrusion detection
- Video surveillance

The access/entry control systems are typically comprised of traditional and Power Over Ethernet (PoE) card readers, biometric readers, keypads, electrified door locks, remote door release, analog and IP intercom systems, request to exit buttons, passive infrared request to exit sensors, intelligent door controllers, heat and humidity sensors, security management software, access control server, LAN/WAN accessibility, visitor management system, and badging stations.

The intrusion detection designs include door position switches, motion sensors, occupancy sensors, glass break sensors, LAN/WAN integration, and burglar alarm panels.

The video surveillance system designs include analog cameras, digital IP PoE cameras, video servers, video management software, Digital Video Recorders (DVRs), networked video storage, security network switches, LAN/WAN accessibility, standalone video surveillance systems, as well as integrated security management solutions. All of our designs are closely integrated with the activities of the infrastructure and IT teams.

Structured Cabling System Design Services: The Structured Cabling System Design Practice provides Structured Cabling System design and consulting services. Many of our design consultants have been trained by the Building Industry Consulting Service International (BICSI) and carry a certification of Registered Communications Distribution Designer (RCDD). We have direct experience in the evaluation, design, selection, implementation, and testing/certification of voice and data cabling systems for 10,000 sf. office spaces to large corporate headquarters spaces in excess of 800,000 sf. We have designed systems within both corporate owned facilities and multi-tenant high-rise spaces. In addition, we have the project management experience required to coordinate these activities during contractor installation. These capabilities assure that the system will be installed in a cost effective manner, based on documented plans and specification. Our Structured Cabling System Design Services Include:

- Cabling System Assessment and Certification
- Structured Cabling System Design and RFP
- Cable System and Vendor Selection
- Documentation of New and Existing Systems
- Installation Project Management
- Site Commissioning and Testing

Data Center Design Services: Our staff of RCDD's have extensive experience with the specific design requirements of data centers and co-location facilities and have completed layouts ranging from 2,000 sf. up to 100,000 sf. and beyond. We have designed and constructed high performance systems for a large number of data centers using various technologies to align with the Tier level of the facility. Our Data Center Design Services include:

- Cabinet and rack layouts
- Density planning
- Data center equipment layouts
- Structured cabling system design
- Pathway design and planning
- Fiber distribution frame design
- And all other points listed in our Cabling Design Services

Our standards based designs have incorporated a selection of the latest server/network cabinet technologies; including the option to use supplemental cooling, such as, cold doors, in-row cooling and passive exhaust ducts within and above cabinets, in-cabinet cable management and monitored power distribution unit selection. Our designs have utilized single-mode and OM-3/OM-4 multi-mode fiber, Cat-6 and Cat-6A (10Gig) UTP cabling as well as other available media. We have designed both under floor and overhead distribution systems to accommodate the environmental conditions of the data center. We have addressed Top-of-Rack network design and SFP+ cabling systems, redundant SAN fabric infrastructure, and have provided consideration for the emerging 40Gb and 100Gb Ethernet as well as Passive Optical Networks.

3D Laser Scanning & As-Built Documentation: Utilizing the latest laser scanning technology, we can document a building/area quickly and accurately in high definition 3D. Our team of technicians, each with a background in architecture or engineering, have the education and work experience to analyze the most complex building situations. Our 3D Laser Scanning services include:

- As-Built Survey
- Historical Surveys
- Scan to BIM or CAD
- Architectural As-Builts
- Complete BIM models
- GIS Infrastructure
- Space Programming
- Construction Drawings
- CAD to REVIT
- REVIT Consulting
- Construction phasing documentation
- Reverse engineering

Laser scanning is the most accurate and cost effective way of capturing existing data. The 3D scans can be integrated into various design and modeling programs like Revit, Rhino, and AutoCAD. The scan data can also be used to provide field reports, measured surveys, drawings, BIM models, 3D printing, building condition summaries and structural reports, among dozens of other uses. This creates an extremely accurate platform to commence redesign without contractors as-built costs.

Telecommunications Consulting: Over the past several years, Technical Design Services, Inc. and their Enterprise Communications consultants have participated in the convergence of voice and data networks. With the improved viability of Voice over IP (VoIP) services, TDS*i* has recognized that integrating traditional voice and data networks into a single entity can generate increased efficiencies. In order to further this trend, Technical Design Services, Inc. has integrated these traditionally separate consulting practices into a single practice. This integration allows TDS*i* to provide clients with the applicable consulting knowledge from a wide range of expertise – depending on the particular needs of the client. In addition to the voice/data integration services provided by Enterprise Communications Consulting, we also provide more traditional Telecommunications Consulting services. Because we do not resell any telecommunications services or systems, we are a very strong advocate for our clients. Our opinions are objective and our recommendations are practical and cost-effective for our client needs. We can provide whatever level of assistance an organization requires, whether a highly-experienced second opinion or an RFP process is needed. Our Telecommunications Consulting Services include:

- Infrastructure Strategic Planning
- Voice over IP Readiness Review
- Voice over IP System Selection
- Voice over IP Implementation Project Management
- Cost Review
- Needs Assessment
- System Selection
- Telecommunications Systems Implementation
- Long Distance Cost Analysis
- Continuing Education

Network Consulting: In addition to the voice/data integration services provided by Enterprise Communications Consulting, we provide more traditional Network Consulting solutions. Our consultants are highly experienced and work with a wide range of clients to provide high-performance, cost-effective solutions. We pride ourselves in our flexible and creative approach to meeting client needs for network design, implementation, project management and documentation. This practice consists of highly talented consultants with direct experience in IT Strategy, IT Management, Project Management, and Security. Our Network Solutions Consulting Services include:

- Network Design (LAN/WAN)
- Network Assessment
- System Selection
- Implementation
- Strategic Planning
- IT Departmental Assessments
- Project Management
- Security Assessment

CLIENT REFERENCES

TDS*i* specializes in providing structured cabling design, voice communications and data network consulting services to clients who are retrofitting existing buildings and performing new construction. The references listed below are examples of our services for various clients with similar needs. As you will see when you contact them, each of these clients has been extremely happy with our work and performance. Many of our clients have chosen to retain our services again for their technology consulting needs. We pride ourselves on client satisfaction and maintaining long-term relationships.

PRIVATE SECTOR REFERENCES:

Company Name: **United Airlines**
Address: **Chicago, IL**
Phone: **847.700.4319**
Contact Name: **Mr. Kenneth Triebe**
Infrastructure Engineer - United Airlines
Email: **kenneth.triebe@united.com**
Phone: **312.997.7580**
Contact Name: **Mr. Michael Landers, Director - Design and Construction**
Email: **micheal.j.landers@united.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) and Electronic Security System (ESS) Design and Specifications for their Operation Center buildout within the Willis Tower located in Chicago, IL. The new space exceeds 50,000 square feet. The Leviton based SCS was designed to support the services of Voice, Data, and Security for the operation center. Each console received redundant data cabling fed from diverse IDFs (TR). The TR's are cabled back via diverse tube cable pathways to the two MDF Rooms for redundancy. Each TR received copper trunks and 50 micron OM-3 Sumitomo Air-blown fiber backbones.

Company Name: **United Airlines**
Address: **Chicago, IL**
Phone: **847.700.4319**
Contact Name: **Mr. Kenneth Triebe**
Infrastructure Engineer - United Airlines
Email: **kenneth.triebe@united.com**
Phone: **312.997.7580**
Contact Name: **Mr. Michael Landers, Director - Design and Construction**
Email: **michael.j.landers@united.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) and Electronic Security System (ESS) Design and Specifications for their new office space buildout within the Willis Tower located in Chicago, IL. We are currently engaged in their expansion project that now also incorporates Audio Visual (A/V) Design. The new space is made up of over 17 floors in the tower. The combined square footage for the buildout exceeds 825,000 square feet. The Leviton based SCS was designed to support the services of Voice, Data, and Security. In order to deliver those services each floor houses two wiring rooms (TR) (30 total) cabled with copper and 50 micron Sumitomo Air-blown fiber backbones in a physical star topology. The TR's are cabled back via diverse tube cable pathways to the two MDF Rooms for redundancy. TDS*i* has been retained by UAL for a number of other on-going projects at Willis Tower and at other UAL locations, including O'Hare Terminal 2 United Club, where we have designed Panduit based SCS solutions.

Company Name: **United Airlines**
Address: **77 W. Wacker, Chicago, IL**
Contact Name: **Mr. Michael Landers**
Director - Design and Construction
Phone: **312.617.7107**
Contact Name: **Mr. Thomas Songaila - Sr. Manager IT Critical Facilities**
Phone: **847.700.7177**
Type of Work Performed:

We are assisting with the Structured Cabling System (SCS), Electronic Security System and Audio/Visual System Design and Specifications for the new 172,000 sf data Center in Mt. Prospect, IL. Built to be a hidden in plain sight structure, the facility includes a 25,000 sf raised floor space for IT equipment. The systems are designed to support the services of Voice, Data, Security, and DMS/CATV throughout the facility. In order to deliver those services each TR is cabled with 50 micron multimode Air Blown fiber and a small amount of copper in a physical star topology. The TR's are cabled back to two MDF's located in different sections of the facility. The new data center will be connected to the existing data center via a campus Air Blown Fiber system.

Company Name: **Dicks Sporting Goods**
Address: **Pittsburgh, PA**
Phone: **724.273.3668**
Contact Name: **Mr. Scott Snyder**
Lead Network Engineer
Email: **scott.snyder@dcsg.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) Design and Specifications for their new Corporate Headquarters Facility and Data Center located in Pittsburgh, PA. The new facility is made up of four towers having six floors each. The combined square footage for the buildings exceeds 660,000 square feet. The Panduit based SCS was designed to support the services of Voice, Data, Security, and CATV system. In order to deliver those services each building houses six wiring rooms (23 total) cabled copper and 50 micron fiber in a physical star topology. The 23 TR's are cabled back to the Campus Core Room which is in turn connected to the new 10,000 sf. Data Center. The Data Center Systems included copper and fiber backbones, 10Gig Cat-6A Panduit cabling systems, overhead and under floor conveyance, selection of server cabinets and network racks, SAN cabling, and a new VoIP PBX cabling. TIA-942 standards for a Tier 3 Data Center were followed.

Company Name: **Cleveland Clinic**
Address: **Cleveland, Ohio**
Phone: **216.738.5646**
Contact Name: **Mr. Joe Wise**
Director - ITD Facility Planning & Operations

Type of Work Performed:

We developed the Structured Cabling System (SCS) Design and Specifications for their new Data Center located in Brecksville, OH. The new 107,000 sf. facility combines the data center operation from multiple sites in the greater Cleveland area. It is designed to be a lights out operation employing the latest technologies related to cooling, power and IT infrastructure The Corning and Ortronics SCS was designed to support the new server cabinets, network cabinets and SAN within the new 20,000 square ft. Data Hall. The fiber optic cabling design allows for easy migration to 40Gb and 100Gb technologies and can leverage forthcoming deployments of Fiber Channel over Ethernet (FCoE). The Data Hall is connected to the Data Center redundant MDF's and PBX room with both copper and fiber backbones from the centrally located Intermediate Distribution Area on the Data Hall raised floor.

Company Name: **FM Global**
(Factory Mutual Insurance Company)
Address: **Johnston, RI**
Phone: **401.415.1390**
Contact Name: **Mr. Michael Dubinsky,**
Telecommunications Manager and IS Facilities Planning
Email: **michael.dubinsky@fmglobal.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) Design and Specifications for their new Corporate Headquarters Facility and Data Center located in Johnston, RI. The new facility is made up of two towers having four floors each. The combined square footage for the buildings exceeds 383,000 square feet. The Panduit based SCS was designed to support the services of Voice, Data, Security, and CATV system. In order to deliver those services each building houses two wiring rooms (6 active closets and 6 passive closets total) cabled in a physical star topology with copper, 50 micron MM and Singlemode fiber. The 6 TR's are cabled back to the new 11,400 sf. Data Center. The Data Center Systems included copper and fiber backbones, 10Gig Cat-6A Panduit cabling systems, selection of server cabinets and network racks, SAN cabling, and a new VoIP PBX cabling. TIA-942 standards for a Tier 3 data Center were followed.

Company Name: **Tellabs**
Address: **Naperville, Illinois**
Phone: **(630) 798-2052**
Contact Person: **Mr. Norm Engelhardt**
Email: **norm.engelhardt@tellabs.com**
Type of Work Performed:

We provided design/build services for the Corporate Headquarters of Tellabs. This project involved the design and engineering of the structured cabling system as well as in-depth participation in the design of the data center. The scope of our project included the detailed design, product selection, development of detailed specifications, CAD drawings. We partnered with a SYSTIMAX VAR to build the designed system in the 880,000 sf facility. The building was comprised of two 5-story towers having two telecommunications rooms per floor. All were cabled back to the data center or Intermediate Closet using fiber and copper backbones. We continue to provide SCS design, Request for Proposal development, competitive selection and implementation/project management services for Tellabs' projects globally.

Company Name: **Ulta Beauty**
Address: **Bolingbrook, IL**
Phone: **(630) 410-5361**
Contact Name: **Mr. Ed Medina**
IT Technology and Operations
Email: **emedina@ulta.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) Design and Specifications for their new Corporate Headquarters Facility and Data Center located in Bolingbrook, IL. The new space was a tenant improvement project located in a renovated warehouse and manufacturing facility. The combined square footage for two floors and data center was approximately 60,000 sf. The Panduit based SCS was designed to support the services of Voice, Data and Security systems. In order to deliver those services each of the two wiring rooms were cabled in a physical star topology with copper and 50 micron Multimode fiber back to the new first floor 2,500 square feet. Data Center. The Data Center houses the core network, application servers and Storage Area Network for the organization. The SCS within the data center was designed using overhead conveyance for fiber and copper connectivity to each server cabinet. Additionally we have assisted Ulta in the design of similar systems for the distribution facilities.

Company Name: **OfficeMAX**
Address: **Itasca, Illinois**
Phone: **630.438.7408**
Contact Person: **Mr. Vitto Lolino**
Email: **vittololino@officemax.com**
Type of Work Performed:

We provided the design and specification of a new structured connectivity system for an 8,000 s.f. main Data Center. Systems include a copper and fiber backbone, 10Gig Cat-6A SYSTIMAX cabling systems, selection of server cabinets and network racks, SAN cabling, and a new PBX cabling. TIA-942 standards for a Tier 3 data Center were followed.

Company Name: **Kellogg's**
Address: **Oak Brook, IL**
Phone: **630.706.5980**
Contact Name: **Mr. Rodrigo Lau, Lead Network Engineer**
Email: **rodrigo.lau@kellogg.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) Design and Specifications for their new IT Facility and Data Center located in Oak Brook, IL. The new 2-story facility is facility that also houses a new data center on the first floor. The square footage for the buildings exceeds 80,000 sf. The Panduit based SCS was designed to support the services of Voice, Data, and CATV system. In order to deliver those services the building's four wiring rooms are cabled in a physical star topology with copper and 50 micron fiber. The four TR's are cabled back to the secured Main Network Room which is located within the new 10,000 sf. Data Center. The Data Center Systems included copper and fiber backbones, 10Gig Cat-6A Panduit cabling systems, selection of server cabinets and network racks, SAN cabling, and a new VoIP PBX cabling. TIA-942 standards for a Tier 3 data Center were followed. The space included Staging and Tape Rooms as well.

Company Name: **Lucent Technologies**
Address: **Naperville/Lisle, Illinois**
Phone: **630.224.7595**
Contact Name: **Mr. Lyle Schmelzel**
Type of Work Performed:

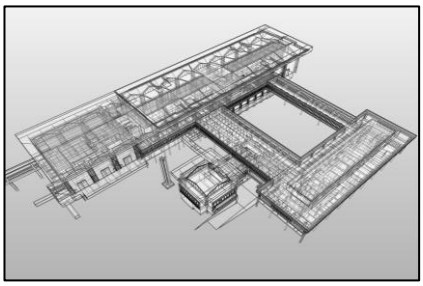
We developed the Structured Cabling System (SCS) and Integrated Building System (IBS) Design and Documentation for two new 660,000 sf Research and Development Facilities located in Naperville and Lisle, Illinois. The SCS was designed to deliver the services of voice, data, video and an intelligent building system. In order to support those services each building houses 17 wiring rooms cabled in a physical star topology with copper and fiber backbones. Each building is made up of two five-story towers linked by a five-story bridge. The combined square footage for the two buildings exceeds 1.2 million square feet. Additionally, TDS*i* prepared the SCS Design for their 25,000 sf data center buildout at Indian Hill Main in Naperville, IL.

Company Name: **Panduit Corporation**
Address: **Tinley Park, IL**
Phone: **708.532.1800 ext.81469**
Contact Name: **Mr. Jeffery Jennings,**
Project Manager - Global Real Estate
Email: **jeffery.jennings@panduit.com**
Type of Work Performed:

We developed the Structured Cabling System (SCS) Audio Visual and Electronic Security System (ESS) Design and Specifications for their new office space buildout in Belgium, Netherlands. The new space is made up of a display area, conference rooms, offices and common areas. The design has been used as the template for sales office buildouts going forward. We were also engaged by Panduit to develop their Corporate Cabling Guidelines for use by Corporate Real Estate during programming exercises. The SCS was designed to support the services of Voice, Data, A/V and Security. In order to deliver those services all infrastructure was unified in a cabinet located with a telecommunication room located within the space. TDS*i* has been retained by Panduit for other on-going projects within their organization.

Company Name:	**United Airlines**
Address:	**Denver, CO**
Phone:	**847.700.4319**
Contact Name:	**Mr. Kenneth Triebe,** **Infrastructure Engineer - United Airlines**
Email:	**kenneth.triebe@united.com**

Type of Work Performed:



We created a high definition 3D scan of the entire 500,000 sf pilot training facility, inside and out, located in Denver, CO. Complex Architectural and MEP Revit models were required by the facilities design team to efficiently supplement the new designs. Due to an extremely tight project timeline, complete as-built Architectural & MEP models were completed simultaneously with the Architects & Engineers retrofit design processes. The existing facilities management, architects and engineers were easily trained to use the scan data, thus drastically reducing site visits and disruptions. All aspects of TDSi's involvement were completed on time, while exceeding the client's expectations. The savings due to the deployment of 3D laser scanning was significant.

Additional key Private Sector projects include:

- *IBEW Local 701 – New Headquarters Facility, Warrenville, IL*
- *American Processing Company – New Data Center in Farmington Hills, MI*
- *CUNNA and Affiliates – New telecommunications system in Madison WI*
- *Grinnell Reinsurance Company – New Telecommunications system and SCS Assessment*
- *JPMC – Multiple engagements throughout US, including rollout assistance*

PUBLIC SECTOR REFERENCES:

Company Name: **City of Crystal Lake**
Address: **Crystal Lake, Illinois**
Phone: **815.356.3700**
Contact Person: **Mr. Ernie Hagenow**
Email: **EHagenow@crystallake.org**
Type of Work Performed:

Alan Priest worked directly with the city for the upgrade to the existing city wide video surveillance system. The upgrade included the following locations; the Municipal Center (City Hall, Police Department, Fire Department, and Public Works), Downtown Metra Station, Pingree Road Metra Station, Three Oaks Recreational Area, and the Prairie Road Bike Path Tunnel. A needs assessment was performed and information was gathered for the video surveillance cameras, network video recorders, cabling, and network for the installation of the new video surveillance system. The design included disparate standalone video surveillance systems into a single integrated video management system, replacing existing and adding additional video surveillance cameras, network video recorders, telecommunication room/IDF/cabinet/ server room design and/or reconfiguration, horizontal and backbone network cabling, and network design. Additionally, the design included an interview recorder system that incorporated interview room cameras, key switches, “interview in session” visual indicators, microphones, recorders, and interview management system. We developed design drawings and specifications, and issued those for bid. We also assisted in the project management and implementation of the designed systems.

Company Name: **Village of Elwood**
Address: **Elwood, Illinois**
Phone: **630.969.7000**
Contact Person: **Mr. Jim Smiley**
Email: **jsmiley@wightco.com**
Type of Work Performed:

Brett Mersch worked as a sub-consultant to Wight and Company for the new Municipal Center. A needs assessment was performed and information was gathered for the cabling, network, telecommunications, and A/V systems for the construction of the new Municipal Center for Village operations and the Police Department. We developed design drawings and specifications, and issued those for bid. We also assisted in the project management and implementation of the designed systems.

Company Name: **Village of Lemont**
Address: **Lemont, Illinois**
Phone: **630.969.7000**
Contact Person: **Mr. Jason Dwyer**
Email: **jdwyer@wightco.com**
Type of Work Performed:

Alan Priest and Brett Mersch worked as sub-consultants to Wight and Company for the new Police Department in the Village of Lemont. A needs assessment was performed and information was gathered for the cabling, network, telecommunications, and A/V systems for the construction of the new Police Department. We developed design drawings and specifications, and issued those for bid. We also assisted in the project management and implementation of the designed systems.

Company Name: **High Intensity Drug Trafficking Area (HIDTA)**
Address: **Milwaukee, WI**
Phone:
Contact Person: **IT Manager**
Email:
Type of Work Performed:

Frank Cerchio and Vince Scorsone performed a needs assessment and information gathering for the structured cabling and wireless systems required for the buildout of the new HIDTA space in an existing building. They also provided design services for the detailed layout of the IT closets and the main computer room in the new facility. They also developed design drawings and specifications, and issued those to contractors for bids. They also assisted in the project management and implementation of the designed systems.

Company Name: **City of Naperville**
Address: **Naperville, IL**
Phone: **630.420.6050**
Contact Person: **Mr. Donald Carlsen**
Email: **carlsend@naperville.il.us**
Type of Work Performed:

Frank Cerchio performed a needs assessment and gathered information for the cabling network upgrades required for the conversion to Ethernet at five city facilities. Design drawings and specifications for the new infrastructure and network equipment were developed and issued to contractors for bidding. He also assisted in the project management and implementation of the designed systems.

Company Name: **City of Naperville**
Police & Fire Departments
Address: **Naperville, IL**
Phone: **630.420.6050**
Contact Person: **Mr. Donald Carlsen**
Email: **carlsend@naperville.il.us**
Type of Work Performed:

Frank Cerchio performed a needs assessment and gathered information for the cabling network upgrades required for the Police and Fire Departments conversion to Ethernet. Design drawings and specifications for the new infrastructure and network equipment were developed and issued to contractors for bidding. He also assisted in the project management and implementation of the designed systems.

Company Name: **Village of North Aurora**
Address: **North Aurora, IL**
Phone: **630.472.0918**
Contact Person: **Mr. David McVey**
Email: **dpmcvey@gage-inc.com**
Type of Work Performed:

Alan Priest worked as a sub-consultant to Gage Consulting Engineers, Inc. He performed a peer review for the cabling infrastructure required for the construction of the new Police Department.

Company Name: **Village of Orland Park**
Address: **Orland Park, IL**
Phone: **708.403.6210**
Contact Person: **Mr. Norm Johnson**
Email: **njohnson@orland-park.il.us**
Type of Work Performed:

Brett Mersch and Frank Cerchio performed a needs assessment and gathered information for the new backbone cabling system, required for connecting the Municipal Facility to the new Police Department. They provided design services for the detailed layout of the main computer room in the new Police Department. Design drawings and specifications were developed and issued for bid. They also assisted in the project management and implementation of the designed systems.

Company Name: **88th Regional Readiness Command, U.S. Army Reserve**
Address: **Fort Sheridan, IL**
Phone: **630.645.1926**
Contact Person: **Mr. Marc Rhode**
Email: **mrohde@legat.com**
Type of Work Performed:

Alan Priest and Frank Cerchio worked with Legat Architects for the new training facility for the Armed Forces Reserve Center. They performed a needs assessment and gathered information for the new fiber and copper backbone systems required for connecting the new training facility to the existing base campus fiber and copper backbone systems. They also provided structured cabling system design services for the new two-story, 72,000 sf training center with classrooms, training rooms, weapons simulator, drill hall, library, learning center, offices and a physical fitness area. Design drawings and specifications were developed and issued to the design/build contractor. They also assisted in the project management and implementation of the designed systems.

EDUCATION MARKET PROJECTS:

- Lake Forest College, IL – New Moore Residence Hall
- North Central College, IL – Main Computer Room design, Campus backbone upgrades, new Residence Hall and Recreation Center, New Performing Arts center, New Stadium
- Wheaton College, IL – Beamer Center, New Science Building, renovations to other facilities
- City Colleges of Chicago – 5 Year Capital Plan Development
- Dordt College, IA – New Computer Room design
- Lewis University, IL – Science Building Addition
- University of Michigan, MI – Campus Telephone system design and consulting
- Naperville School District 203 – Renovation to Central High School, District wide VoIP Telephony deployment, renovations to various schools, new Early Childhood Center facility.
- Elmhurst School District 205 - Facility renovations
- Glen Ellyn School District 89 - Facility renovations and new district telephone system
- Joliet Township High Schools, IL - Facility renovations and Science Lab upgrades
- New Trier Township High School District 203 – Renovations at East and West Campuses
- Riverside-Brookfield High School, IL - Facility renovations and new district telephone system
- Valley View School District 365U – New school construction and existing facility renovations

Biographies of Key Consultants

Frank J. Cerchio, RCDD ***Designer, Project Manager, Principal***

Frank Cerchio is the Design Department Manager and President of Technical Design Services, Inc. Mr. Cerchio specializes in the design and implementation of Structured Connectivity Systems. He has over thirteen years of experience in the information technology arena as an end user, contractor and consultant. Mr. Cerchio received his Bachelor of Science degree from the University of Illinois at Champaign. He is a member of Building Industry Consulting Service International (BICSI), an international telecommunications association, from which he has earned the designation of Registered Communications Distribution Designer (RCDD). Certain cabling product manufacturers have certified him in the design and implementation of their systems as well.

Prior to starting Technical Design Services, Inc. in 1999, Frank was a Manager in the Integrated Technologies Solutions Group for a large national accounting and consulting firm. He provided design and consulting assistance to a wide variety of clients in different areas of the country. Engagements generally consisted of producing drawings and specifications which were issued to contractors for competitive bidding, performing site audits and analysis of existing cabling systems, and providing product and contractor evaluations.

Prior to his work at the large accounting and consulting firm, Frank worked for a local engineering and design company where he performed similar design and consulting services for the firm's clients. In addition to these tasks, Frank managed the local area network and CAD department. This required interfacing with the mechanical, electrical and plumbing design teams on a regular basis. Regular contact and collaboration with the architects and clients involved in construction projects were essential as well.

Frank's cross discipline experience has given him a unique understanding of cabling systems requirements. His understanding of how networks and pc's operate allows him to engage in intelligent conversations with clients about their needs. As stated earlier, Frank's projects have included a wide variety of clients in many regions of the country. He has designed systems for school districts, medical institutions, manufacturing facilities, and private as well as commercial institutions.

Some of Frank's recent projects include:

- ***United Airlines*** - Lead Designer and Project Manager - We are assisting with the Structured Cabling System (SCS), Electronic Security System and Audio/Visual System Design and Specifications for the new 172,000 sf data Center in Mt. Prospect, IL. The facility includes a 25,000 sf raised floor space for IT equipment. The systems are designed to support the services of Voice, Data, Security, and DMS/CATV throughout the facility. In order to deliver those services each TR is cabled with 50 micron multimode Air Blown fiber and a small amount of copper in a physical star topology. The TR's are cabled back to two MDF's located in different sections of the facility. The new data center will be connected to the existing data center via a campus Air Blown Fiber system. Data Center Systems include copper and fiber backbone to the MDF's, 10Gig OM-4 fiber cabling ,Cat-6 LAN cabling systems, selection of server cabinets and network racks, SAN cabling design, and a new Demarc extension for the corporate WAN. TIA-942 standards for a Tier 3 data Center were followed.
- ***United Airlines*** - Lead Designer and Project Manager - We are currently assisting with the Structured Cabling System (SCS) Design and Specifications for the 6NE Lab at the Willis Tower project. The new lab is designed to simulate the airport environments that exist in UAL occupied terminals. This includes gate stations, check-in podiums, FIDS, club environments, cargo environments and various back end systems and printing solutions.
- ***United Airlines*** – Lead Designer and Project Manager - We are currently assisting with the Structured Cabling System (SCS) Design and Specifications for the Elk Grove Relocation to Willis Tower project. The new tenant improvement includes fifteen (15) floors in the Willis Tower. The combined square footage for the space exceeds 750,000 square feet. The SCS was designed to support the services of Voice, Data, Security, and DMS/CATV system. In order to deliver those services each floor houses two wiring rooms (28 total TR's) cabled with 50 micron multimode Air Blown fiber and a small amount of copper in a physical star topology. The TR's are cabled back to two MDF's located on different floors.

The two MDF's are connected with both multimode and singlemode Air Blown Fiber via diverse paths and risers. The MDF's are also connected to the Elk Grove Data Center via diverse metro fiber paths using multiple carriers.

- ***United Airlines*** - We are currently proposing on assisting with the Structured Cabling System (SCS) Design and Specifications standards updates for the airport and corporate environments This includes all aspects of technology physical layer infrastructure deployed within the enterprise and at airports including gate stations, check-in podiums, FIDS, club environments, cargo environments and various back end systems, printing solutions IDF configurations, connectivity specifications and manufacturer selections. Other UAL projects that Frank is involved with and oversees include:
  - ***United Clubs***
    - ***at O'Hare Airport in Terminal 2***
    - ***at SEA***
    - ***at SFO (beginning 02/2013)***
- ***Cleveland Clinic -*** Developed the Structured Cabling System (SCS) Design and Specifications for their new Data Center located in Brecksville, OH. The new 107,000 sf facility combines the data center operation from multiple sites in the greater Cleveland area. It is designed to be a lights out operation employing the latest technologies related to cooling, power and IT infrastructure The SCS was designed to support the new server cabinets, network cabinets and SAN within the new 20,000 sf Data Hall. The fiber optic cabling design allows for easy migration to 40Gb and 100Gb technologies and can leverage forthcoming deployments of Fiber Channel over Ethernet (FCoE). The Data Hall is connected to the Data Center redundant MDF's and PBX room with both Copper and Fiber backbones from the centrally located Intermediate Distribution Area on the Data Hall raised floor.
- ***Dick's Sporting Goods*** - We are currently assisting with the Structured Cabling System (SCS) Design and Specifications for their new Corporate Headquarters Facility and Data Center located in Pittsburgh, PA. The new facility is made up of four towers having six floors each. The combined square footage for the buildings exceeds 660,000 square feet. The SCS was designed to support the services of Voice, Data, Security, and CATV system. In order to deliver those services each building houses six wiring rooms (23 total) cabled copper and 50 micron fiber in a physical star topology. The 23 TR's are cabled back to the Campus Core Room which is in turn connected to the new Data Center. The Data Center. Systems included copper and fiber backbone, 10Gig Cat-6A Panduit cabling systems, selection of server cabinets and network racks, SAN cabling, and a new VoIP PBX cabling. TIA-942 standards for a Tier 3 data Center were followed.
- ***FM Global New Headquarters*** – Developed a design and specification of a new structured connectivity system for a 383,000 sf., 3-story + ground level corporate headquarters office facility and 11,400 sf. main Data Center. Systems included multiple wiring closets, copper and fiber backbone, 10Gig Cat-6A cabling systems, plug-and-play 10Gig fiber cabling systems, selection of server cabinets and network racks, SAN cabling, and a new Demarc. TIA-942 standards for a Tier 3 data Center are being followed. An existing building will also be connected via a new camps backbone system.
- ***JP Morgan Chase*** – Performed Data Center assessment activities for sites in Dallas, TX and Belleville, MI. we reviewed the infrastructure, made recommendations for improvements, assessed condition of various SAN cabling components and helped trouble shoot problematic connections. We developed a report of our findings and recommendation which JPMC used for ongoing and further improvements in their facilities.
- ***Cedar-Sinai Hospital*** – Performed Data Center assessment activities for their co-location site in Los Angeles, CA. we reviewed the cabling infrastructure, Data Center layout, made recommendations for improvements. We developed a report of our findings and recommendation which Cedar-Sinai used for making corrective action prior to acceptance of the site and for making ongoing and further improvements at this location.

- ***Kellogg Company*** – Design and specification of a new structured connectivity system for an 80,000 sf. 2-story IT facility and 10,000 sf. main Data Center. Systems included multiple wiring closets, copper and fiber backbone, 10Gig Cat-6A cabling systems, selection of server cabinets and network racks, SAN cabling, and a new Demarc. TIA-942 standards for a Tier 3 data Center were followed.
- ***Ulta Salon, Cosmetics and Fragrance*** – Design and specification of a new structured connectivity system for a 30,000 sf., corporate Headquarters office space build out and a new 3,000 sf. main Data Center. Systems included a single wiring closet, copper and fiber backbone, Cat-6 cabling systems, selection of server cabinets and network racks, SAN cabling, and a new Demarc. TIA-942 standards for a Tier 2 data Center were followed. We have also design the cabling system for their West Coast distribution center in Phoenix, AZ and their new North-East Distribution Center in Chambersburg, PA.
- ***Tellabs Operations, Inc.*** – Directed the design team for the new Global Headquarters building located in Naperville, Illinois. The design for this twin tower, five story, 880,000 square feet facility incorporated over 20 Telecommunications Closets, an Intermediate Closet and an 8,400 square feet Main Computer room requiring voice and data backbone cabling utilizing both copper and fiber optic cabling systems. With over 5,000 drop locations, the horizontal cabling required the design of cable tray system throughout the facility. Special attention was paid to distributing services to the modular furniture systems and the unique cabling requirements of labs.
- ***OfficeMax*** – Design and specification of a new structured connectivity system for an 8,000 s.f. main Data Center. Systems included copper and fiber backbone, 10Gig Cat-6A cabling systems, selection of server cabinets and network racks, SAN cabling, and a new PBX cabling. TIA-942 standards for a Tier 3 data Center were followed.
- ***International Brotherhood of Electrical Workers (IBEW) Local 701*** – Developed designs and specifications for the Structured Cabling System for the new headquarters facility being built in Warrenville, Illinois. This 2-story facility will have a Media Room and remote closets connected with a 12-strand 50-micron multimode fiber, a 12-strand singlemode fiber and a 300-pair copper backbone. The data and voice station cabling specified will be Category 6 compliant and will run the CCTV camera system as well. The building will house the DuPage County Joint Apprentice Training Committee and its classrooms as well. TDS*i* is responsible for the Network, Telecommunications, CCTV, Access Control and A/V designs for the new headquarters.
- ***City of Naperville, IL*** - Provided SCS and Network Equipment Design and Specifications for the multiple buildings including the Municipal Center, Electric Service Center, Police Station and Fire Station for the Ethernet conversion project. Projects also included developing a metropolitan area network connecting the Main city buildings using outside plant cabling in a combination of pathways, including duct-banks, direct buried inner duct, etc.
- ***Tellabs Operations, Inc.*** – Participated on the design team for the New Manufacturing and Office Facility in Ronkonkoma, New York. The design incorporated drop locations in modular furniture systems, open office type cabling in the manufacturing area, multiple wiring closets requiring voice and data backbone cabling utilizing both copper and fiber optic cabling systems that were to be routed in a cable tray.
- ***Tellabs Operations, Inc.*** – Participated on the design team for the New Office Facilities in Warrenville, IL, Chelmsford, MA, Ft. Lauderdale, FL, Alpharetta, GA. The design incorporated drop locations in modular furniture systems, offices, multiple wiring closets requiring voice and data backbone cabling utilizing both copper and fiber optic cabling systems that were to be routed in a cable tray. The campus has two building interconnected with a fiber and copper backbone via underground conduits.
- ***Lucent Technologies, Inc.*** – Participated on the design team for the New Research and Development Facility in Naperville, IL and the New Network Software Center in Lisle, IL. The design for these 660,000 sq. ft. buildings incorporated drop locations using both copper and fiber in modular furniture systems, offices and conference rooms. These five story complexes required multiple wiring closets with voice and data backbones utilizing both copper and fiber optic cabling systems that were routed

in a cable tray. A campus backbone utilizing mulitmode and singlemode fiber as well as copper cabling was also designed.

- ***Allegiance Telecom –*** Develop a standard set of design documents that could be adapted to the various site conditions for each new facility being constructed across the country. Drop location floor plans, installation details, and specifications were issued to the General Contractor who in turn was able to select a qualified installation contractor. The systems were consistent from site to site.
- ***Agnesian Healthcare*** – Design, specify, and issue for bids the structured cabling system, including horizontal, riser and campus backbone cabling, for two new multistory Clinics on the hospital's campus in Fond du Lac, WI. Assisted in bid evaluations and contract negotiations
- ***New Trier High School*** - Design, specify, and issue for bids the structured cabling system, including horizontal, riser and building backbone cabling, for this large five floor high school. Interfaced with the School's Architect and Electrical Engineer to provide a complete package for technology plan implementation.
- ***And many more including these past clients…***
  - ***Yorkville Community Unit School District 115***
  - ***HA-LO Industries, Inc.***
  - ***New York Athletic Club***
  - ***AAA North Jersey***

Frank's designs have included the use of Unshielded Twisted Pair, Fiber Optic, and Coaxial cabling, as well as Wireless technology. These structured connectivity systems have been used for voice, data and video transmission. His understanding of TIA/EIA standards for cabling, pathways, grounding and administration coupled with his training and experience aid in the design of high performance cabling systems. The product knowledge and experience amassed over the years helps assure the designs meet the client's technology and budgetary needs both now and in the future.

Alan R. Priest, RCDD — *Designer, Project Manager*

Alan Priest is a Security Systems Design Practice Leader with Technical Design Services, Inc. Mr. Priest is an experienced Low Voltage Systems Designer and Project Manager. He has been responsible for the master planning of security and communication systems and network operation facilities.

With over 10 years in the industry, Alan's special skills include design and management of projects involving complex copper and fiber voice/data communications systems, data centers, wireless networks, access control systems, intrusion detection systems, closed circuit television and IP video surveillance systems, public address systems, analog and digital master antenna systems, and complete inter-building connectivity engineering. He also has over 12 years of AutoCAD experience.

He is a member of Building Industry Consulting Service International (BICSI), an international telecommunications association, from which he has earned the designation of Registered Communications Distribution Designer (RCDD). He has also been certified by certain cabling product manufacturers in the design and implementation of their systems.

Some of Alan's recent project experience includes:

- ***United Airlines –*** Designed a complete Security infrastructure including intrusion detection, video surveillance, access control using bio/pin/prox, and IP interfaces for a number of UAL projects. Security design included IP megapixel cameras, proximity card readers, bio-metric readers, IP/PoE card access, security command center, and enterprise security software to work in conjunction with other existing UAL systems. Project locations include:
  - ***United Headquarters Relocation to Willis Tower in Chicago, IL – 750,000 sf***
  - ***United Airlines New Data Center in Mt Prospect, IL – 172,000 sf***
  - ***United Clubs***
    - ***at O'Hare Airport in Terminal 2***
    - ***at SEA***
    - ***at SFO (beginning 02/2013)***
- ***United Airlines –*** Designed a complete Audio Visual infrastructure for conference rooms, board room, common area displays including projection systems, digital media player, monitors, digital control systems and software to work in conjunction with other existing UAL systems. Project locations include:
  - ***United Headquarters Relocation to Willis Tower in Chicago, IL – 750,000 sf***
  - ***United Airlines New Data Center in Mt Prospect, IL – 172,000 sf***
  - ***United Clubs***
    - ***at O'Hare Airport in Terminal 2***
    - ***at SEA***
    - ***at SFO (beginning 02/2013)***
- ***Panduit Corporation, Tinley Park, IL*** – Designed the Electronic Security System (ESS) Design and Specifications for their new office space buildout in Belgium, Netherlands. The new space is made up of a display area, conference rooms, offices and common areas. The design has been used as the template for sales office buildouts going forward. We were also engaged by Panduit to develop their Corporate Cabling Guidelines for use by Corporate Real Estate during programming exercises. The SCS was designed to support the services of Voice, Data, A/V and Security. In order to deliver those services all infrastructure was unified in a cabinet located with a telecommunication room located within the space. TDSi has been retained by Panduit for other on-going projects within their organization.

- ***Edward Hines VA*** – Designed a complete LAN infrastructure system, including voice, data, wireless, Electronic Security and AV systems for multiple facilities on the campus. The project included a surgical simulation system with multiple camera, displays and recording capabilities. Additionally, the designs included a parking lot Security system.
- ***Exelon*** – Designed a complete LAN infrastructure system, including voice, data and wireless for a 10 floor corporate office. The project included multiple backbone redundancy incorporated into the design, WAN connectivity to an off-site data center and cellular service provider signal boosting within the existing 60 story building.
- ***American Academy of Sleep Medicine –*** Designed a complete LAN infrastructure, including data, voice, security, and audio-visual systems. Design included a lecture room and dividable training room audio-visual design that featured large front projection screens, multi-AV inputs from laptops within room and media players within AV cabinets, wireless microphone speech reinforcement and media amplification and distribution, and wall mounted LCD touch screen and push button AV controls. The dividable lecture room was designed with capabilities to present separate audio and video media in each of the partitioned areas or work as a single entity with simultaneous audio and video distribution to each of the projectors and sound systems.
- ***American Airlines***– Provided the project design of a complete LAN infrastructure system including; data, voice and FID'S (Flight Information Displays), for gate terminal conversions and/or relocations in over 10 major airports around the U.S.
- ***Camping World*** – Provided the design of a complete LAN infrastructure system including; data, voice over IP, access control, intrusion detection, IP intercom, and IP video surveillance systems for the tenant built-out.
- ***Chicago Fire Department***. – Provided design of a complete LAN infrastructure system, including data, voice, SATV/CATV, 911-call center, and public address system for the new 22,000 sq-ft Air/Sea Rescue Facility.
- ***DHL CVG Hub*** – Infrastructure design for voice and data communications within the 300,000-sq-ft facility and over a Wide Area Network to link two facilities and several guard shacks with the main command center.
- ***Dover Air Force Base*** – Provided the design of a complete voice and data LAN, closed circuit television, access control, intrusion detection, public address, and mass notification infrastructure system for two new cargo and office facilities. The project design included inter-building Outside Plant engineering for network connectivity of the two buildings, tie with existing base network infrastructure, and Secured Compartmented Information Facility security design to military specifications.
- ***Dubai Airwing*** – Provided the complete infrastructure design for voice, data, FID's (Flight Information Displays), SATV, and public address system communication within the airport and over a Wide Area Network linking the radio antenna, maintenance facility and security gate house with the main telecommunication room in the airport.
- ***eBay*** – Design of complete LAN infrastructure system, including voice, data and wireless for 280,000-sq-ft corporate office. The project design also included two data centers as well as inter-building pathway, network connectivity of multiple buildings and cellular service provider signal boosting within the building.
- ***Fort Sheridan, Armed Forces Reserve Center*** – Provided the design of a complete voice and data LAN structured cabling system for two new joint use office and maintenance facilities. The project design included inter-building Outside Plant engineering for network connectivity of the two buildings, tie with existing base network infrastructure, and secured network design to military specifications.
- ***General Electric Financial Headquarters*** – Designed a complete LAN infrastructure system, including voice, data, wireless, closed circuit television, intrusion detection, and access control systems, for this class A office space. Required close work with the architect to achieve world class aesthetics and the

stringent requirements of the GE IT team. This project also included satisfying design requirements for the state of the art technology Hewlett Packard "Halo" video conferencing room.

- ***Independence Air –*** Coordination and management of a complete voice and data LAN infrastructure system, for ticket counters, ticketing office, ramp operations and gate terminals in over 35 major airports around the United States.
- ***Jet Blue –*** Designed a complete LAN infrastructure system, including data, voice Kronos time clocks, FID's (Flight Information Displays), SATV, CCTV, Intrusion Detection, PBX and public address system for the new Technology Support Operations facility.
- ***Lewis University, Science Center Addition, Romeoville, IL –*** Designed a complete LAN infrastructure, including data, voice, and audio-visual systems. Design included providing data and voice connectivity to the existing building LAN infrastructure for the new Telecommunications Rooms and Audiovisual design for classrooms and labs.
- ***Lemont Police Department –*** Designed a complete LAN infrastructure, including data, voice, and audio-visual systems. Design included community room /emergency operations center audio-visual design that featured a 15' front projection screen, multi-AV inputs from laptops within room and media players within AV cabinets as well as speech reinforcement, media and police radio amplification and distribution. Similar designs were developed for police roll call and smaller conference rooms as well.
- ***Los Angeles Police Headquarters –*** Designed a complete LAN infrastructure, including data, voice, and paging systems. Design also included connectivity of down/up links for media press conferences and a helicopter roof top link station, as well as Outside Plant connectivity of the old LAPD headquarters with the new facility.
- ***LSG/Sky Chefs –*** Designed a complete LAN infrastructure system, including data, voice, Kronos time clocks, FID's (Flight Information Displays), SATV, and public address system for the new 200,000-sq-ft flight kitchen facility.
- ***Naperville Central High School, Naperville, IL –*** Designed of complete video surveillance and access control system. Design included IP megapixel cameras, proximity card readers, and enterprise access control and video surveillance security software.
- ***Northwest Airlines Flight Kitchen –*** Designed a complete LAN infrastructure system, including data, voice, Kronos time clocks, FID's (Flight Information Displays), SATV, and public address system for new 300,000-sq-ft flight kitchen facility.
- ***Oswego Public Library, Montgomery Campus –*** Designed a complete LAN infrastructure, including data, voice, intercom, intrusion detection, video surveillance, access control, and audio-visual systems. AV Design included community room audio-visual design that featured a 12' front projection screen, multi-AV inputs from laptops within room and media players within AV cabinets as well as speech reinforcement, media amplification and distribution, and AV control panels. Similar designs were developed for program room and board room as well. Security design included IP megapixel cameras, proximity card readers, IP video intercom, and enterprise security software to work in conjunction with other branch.
- ***Port Authority of New York and New Jersey –*** Gathered site information for Perimeter Intrusion Detection System (PIDS) project at the four PANYNJ district airports; JFK, LaGuardia, Newark and Teterboro. The project data collection utilized GIS (global information system) in conjunction with pre-beta AutoCAD MAP technology to identify and document the airfield perimeter security. The pre-beta AutoCAD MAP software involved working with Microdesk to design and develop the software for general use.
- ***Seminole Tribe of Florida –*** Designed a complete electronic security system for multiple new and existing facilities at multiple reservations across south Florida for the Seminole Tribe. Project scope included site vulnerability assessments and completing existing conditions reports for existing sites, designing the IP Video Surveillance, Intrusion Detection, and Access Control Systems, coordinating

the design across all disciplines, working with the integrators to procure bids, and validating the quotations. The project also included gaining additional services contracts for the design of a wide area network for connecting facilities to the local Seminole Tribe Public Safety Complexes and the main headquarters facility in Hollywood, FL as well as data and voice designs for all of the new facilities to be constructed.

- ***TSA (Transportation Security Administration)*** **–** Design of integrating CTX 5500 machines, scanners and other x-ray and explosion detection machines into TSA's network infrastructure in over 50 major airports around the United States.
- ***University of Illinois Medical Research Facility*** **–** Design of a complete LAN infrastructure system, including data, voice, rescue assistance call stations, as well as exterior connectivity of bollard Parking Assistance Units, bollard Emergency Assistance Units and parking gates for the new 155,000-sq-ft medical research facility.
- ***Watson Laboratories*** **–** Design of a complete electronic security and data/voice LAN infrastructure system. The security design comprised of motion detectors, door contacts, card readers, glass break sensors, zoning and rescue assistance call stations. The design also included data and voice WAN connectivity of the 200,000-sq-ft laboratory and clients' existing buildings.
- ***World Financial Center*** **–** Worked in New York as part of a September Eleventh Disaster Recovery team. Aided the project architect in designing to rebuild and reoccupy the 50+ story American Express building.

Alan's structured cabling system designs have included server rooms, equipment rooms (MDF), telecommunications rooms (IDF), horizontal and vertical riser distribution and data centers. These room layouts designs encompassed placement of racks, cabinets, AC units, Uninterruptable Power Supplies, grounding equipment, and work area outlet configurations. The rack and cabinet details included front and rear elevations of fiber enclosures, patch panels, vertical and horizontal wire management, active and passive electronics, and power requirements. The UPS details included calculation of the power consumption of the room's equipment and identification of redundancy requirements. The grounding details included requirement of grounding to the building ground, identification and placement of telecommunication ground bar(s), ground cable riser distribution, and grounding of telecommunication equipment. The vertical riser distribution designs included core or sleeve locations and sizes, sizing and distribution of singlemode, multimode, multi-pair copper, and coaxial cable. The horizontal distribution designs included the distribution of UTP and coaxial cabling, 90 meter distance checks, conduit and tray layout and sizing, work are outlet configurations, and wireless access points.

The audiovisual systems designs comprised of non-motorized and motorized projection screens, projectors, direct view displays, Blu-Ray players, Digital Video Disk (DVD) players, wired and wireless microphone systems, sound reinforcement systems, analogue and digital control panels, audio and video switchers, audiovisual matrix controllers, and video conferencing.

The access control designs comprised of card readers, biometric readers, keypads, door contacts, electrified door locks, remote door release, analog and IP intercom systems, request to exit buttons, passive inferred request to exit sensors, intelligent door controllers, alarm panels, heat and humidity sensors, access control software requirements, access control server, guest management system, and badging stations.

The video surveillance designs included analog cameras, digital IP cameras, video servers, video management server, Digital Video Recorders (DVRs), networked video storage, security network switches, stand alone video management systems as well as integrated access control and video management solutions.

Brett Mersch ***Designer, Project Manager***

Brett Mersch is a Structured Cabling System Design Practice Leader with Technical Design Services, Inc. Mr. Mersch specializes in the design and specification of Structured Connectivity Systems. He has over eight years of experience working with information technology as a structured cabling designer and consultant. Mr. Mersch is a member of Building Industry Consulting Service International (BICSI), an international telecommunications association, and is working toward earning the designation of Registered Communications Distribution Designer (RCDD). Brett has been certified by certain cabling product manufacturers in the design and implementation of their systems as well.

Prior to joining Technical Design Services, Inc. in 1999, Brett was a Senior Consultant in the Integrated Technologies Solutions Group for a large national accounting and consulting firm. He provided design and consulting services to various firm clients. Projects typically consisted of site inspections, design drawing development, specifications, formal Bid release meetings and project management of the installation.

Prior to his work at the large accounting and consulting firm, Brett worked for a local communications design and engineering company where he performed similar design and consulting services for the firm's clients. Brett was also the lead Computer Aided Drafting Technician.

Brett's past experience with a wide range of client needs has given him an extensive understanding of cabling systems requirements. Brett's projects have allowed him to design systems for school districts, medical institutions, manufacturing facilities, and commercial institutions. His excellent Computer Aided Drafting skills and knowledge gained from his experiences allow him to produce a truly comprehensive design and documentation package.

Some of Brett's recent projects include:

- ***United Airlines*** – Designer (Horizontal and ABF) - We are currently assisting with the Structured Cabling System (SCS) Design and Specifications for the Elk Grove Relocation to Willis Tower project. The new tenant improvement includes fifteen (15) floors in the Willis Tower. The combined square footage for the space exceeds 750,000 square feet. The SCS was designed to support the services of Voice, Data, Security, and DMS/CATV system. In order to deliver those services each floor houses two wiring rooms (28 total TR's) cabled with 50 micron multimode Air Blown fiber and a small amount of copper in a physical star topology. The TR's are cabled back to two MDF's located on different floors. The two MDF's are connected with both Multimode and singlemode Air Blown Fiber via diverse paths and risers. The MDF's are also connected to the Elk Grove Data Center via diverse metro fiber paths using multiple carriers. Other UAL projects with similar requirements include:
  - ***United Airlines New Data Center in Mt Prospect, IL – 172,000 sf***
  - ***United Clubs***
    - ***at O'Hare Airport in Terminal 2***
    - ***at SEA***
    - ***at SFO (beginning 02/2013)***
- ***Panduit Corporation, Tinley Park, IL*** Designed the Structured Cabling System (SCS) and Audio Visual System and along with Specifications for their new office space buildout in Belgium, Netherlands. The new space is made up of a display area, conference rooms, offices and common areas. The design has been used as the template for sales office buildouts going forward. We were also engaged by Panduit to develop their Corporate Cabling Guidelines for use by Corporate Real Estate during programming exercises. The SCS was designed to support the services of Voice, Data, A/V and Security. In order to deliver those services all infrastructure was unified in a cabinet located with a telecommunication room located within the space. TDSi has been retained by Panduit for other on-going projects within their organization.

- ***Naperville Central High School -*** Design, specify and issue for bids the data/voice/video structured cabling system for recent high school renovation projects. The cabling design involved routing new data and voice cabling from the existing Main Computer Rooms to various building Telecom Rooms and out to work spaces and classrooms. Enhanced AV systems were designed and specified for many of the classrooms and included a large multiscreen display system in the cafeteria. The renovation project also included new electronic way-finding displays throughout the facility. This was being accomplished in a phased approach. The infrastructure designs generally required new voice and data backbone cabling to be routed through a number of different pathways.
- ***Valley View School District 365U -*** Design, specify and issue for bids the data/voice/video structured cabling system for more than half the district's schools that have undergone recent renovation projects. The cabling design involved routing new data and voice cabling from the existing Main Computer Rooms to various building Telecom Rooms and out to work spaces and classrooms. The infrastructure designs generally required new voice and data backbone cabling to be routed through a number of different pathways.
- ***Riverside/Brookfield High School -*** Design, specify and issue for bids the data/voice/video structured cabling system for recent high school renovation projects. The cabling design involved routing new data and voice cabling from the existing Main Computer Rooms to various building Telecom Rooms and out to work spaces and classrooms. This was being accomplished in a phased approach. The infrastructure designs generally required new voice and data backbone cabling to be routed through a number of different pathways.
- ***Winnetka School District 36 -*** Design, specify and issue for bids the data/voice/video structured cabling system for a number of the district's schools that have undergone recent renovation projects. The cabling design involved routing new data and voice cabling from the existing Main Computer Rooms to various building Telecom Rooms and out to work spaces and classrooms. The infrastructure designs generally required new voice and data backbone cabling to be routed through a number of different pathways. The projects also include development of a new fiber backbone connecting multiple schools within the district.
- ***New Trier High School West Campus-*** Design, specify and issue for bids the voice backbone structured cabling system for the high school's west campus re-commissioning project. The cabling design involved routing new voice backbone cabling from the existing Main Computer Room to various buildings throughout the campus. The infrastructure design required new voice and data backbone cabling to be routed through a number of different pathways.
- ***Edward Hospital - Plainfield*** – Design, specify, and issue for pricing the structured cabling system, including horizontal, riser and campus backbone cabling, for a new multistory Cancer Center on the hospital's campus in Plainfield, IL. Assisted the contractor in development of the final Design/Build requirements and reviewed with the owner.
- ***Rush Presbyterian St. Luke's Medical Center-*** Design, specify and issue for bids the voice backbone structured cabling system for the hospital campus. The cabling design involved routing new voice backbone cabling from three existing Node Rooms for the purpose of decommissioning four other Node Rooms throughout the campus. The infrastructure design required new voice backbone cabling to be routed from the decommissioned Node Rooms to the existing Node Rooms. The new voice backbone cabling was spliced onto the existing riser cabling that was being served out of the decommissioned Node Rooms and extended back to new voice frames within the existing three Node Rooms. This design also required the new voice frames to co-exist with the old voice frames until the cut over process was complete.
- ***Exempla Healthcare*** – Assisted with the Specification and design documents issued to contractors for bidding the installation of cabling systems for the Hospital's large 11 floors and 22 wiring closet structure. The facility required horizontal cabling to be routed to multiple cabinet/closets, which were in turn connected via fiber optic cable to the main computer room. Project management was also performed.

- ***Perry Memorial Hospital*** – Design, specify, and issue for bids the structured cabling system, including horizontal, riser and building backbone cabling, for this large four floor hospital.
- ***Rush Prudential Health Plans***– Specification and design documents issued to contractors for bidding the installation of cabling systems for one of their medical clinics. The facility required temporary cabling to be provided to maintain their existing systems while new cabling was installed. Project management was also performed.
- ***Lucent Technologies*** – Assisted with the Specification and design documents for bidding the installation of cabling systems for two new 5 story 660,000 s.f. Buildings. The two buildings included 36 wiring closets and approximately 9,500 drop locations. The cabling infrastructure required horizontal cabling to be routed to floor serving telecommunications closets, which were in turn connected via fiber optic cable to the main computer room.
- ***Tellabs Operations, Inc***. – Participated on the design team for the New Manufacturing and Office Facility in Ronkonkoma, New York. The design incorporated drop locations in modular furniture systems, open office type cabling in the manufacturing area, multiple wiring closets requiring voice and data backbone cabling utilizing both copper and fiber optic cabling systems that were to be routed in a cable tray.
- ***Universal Access*** – Design, specify and issue for bids the structured cabling system for their 6 floor 350,000 s.f. Headquarters in Willis (Sears) Tower. The cabling design included 7 wiring closets and approximately 1,100 drop locations. The cabling infrastructure required horizontal cabling to be routed to floor serving telecommunications closets, which were in turn connected via fiber optic cable to the main computer room.
- ***Universal Access*** – Design, specify and issue for bids the structured cabling system for four of their regional office locations throughout the country. The cabling designs included multiple wiring closets and approximately 700 drop locations between the offices. The cabling infrastructure required horizontal cabling to be routed to floor serving telecommunications closets, which were in turn connected via fiber optic cable to the main computer room.
- ***Park Ridge/Niles School District*** – Assisted with the Design, specification, and issue for bids for the structured cabling system, including horizontal and building backbone cabling, for five schools within the district.

Brett's designs have included the use of Unshielded Twisted Pair, Fiber Optic, and various other media to satisfy client needs for information transmission. His understanding of TIA/EIA and BICSI standards for cabling, pathways, grounding and administration allow him to design standards based cabling systems. His excellent balance of product knowledge and experience gained from working with different clients and designers provide him with the proper skill set to meet client needs.

Nicholas Sacco ***Lead AV Technology Consultant***

Nicholas Sacco is the Technology Consultant for Technical Design Services, Inc. Mr. Sacco is an experienced Low Voltage System Design consultant, Technology Designer, and Acoustics Consultant.

With over seven years of experience, Nicholas's special skills include audiovisual, digital signage, public address, mass notification, structured cabling, security, video surveillance, and nurse call systems. He also provides recommendations for improved room acoustics, noise control, and vibration isolation. He also has demonstrated expertise in the areas of operational management and customer service.

Nicholas also is proficient in industry related software, such as AutoCAD, REVIT, and EASE, as well as the Microsoft Office Suite.

Some of Nicholas's recent project experience includes:

- Cedar Rapids Event Center – The existing 150,000 SF U.S. Cellular Center located in Cedar Rapids, IA was renovated to upgrade mechanical, electrical, and technology systems, as well as cosmetic upgrades. In an effort to bring other events and venues into the city, a new event center was constructed next to the 10,000 seat arena. This 125,000 SF facility will house a renovated arena, new conference/event center, and renovated hotel. Some of the arena renovations/additions include: removal of one end of bowl seating to accommodate bigger shows, new restroom facilities, replacement of lighting and controls, new administrative offices, adding rigging to support larger shows, addition of club area to support and enhance VIP experience, incorporate new smoke control system into the existing area, and ADA compliance.

- College of DuPage Berg Instructional Center (BIC) and Student Resource Center (SRC) - The BIC and SRC on the College of DuPage campus were in need of upgrades and enhancements in order to further the educational mission of the college. The new College Center Addition (CCA), a structure connected to both the BIC and SRC, contains a new student commons area, as well as other student services, classrooms, and meeting areas, and serves as the gateway to the main campus. Totaling 815,000 SF, this project includes a combination of lecture and seminar classrooms, new instructional space, new physical science lab, administrative/faculty office space, college radio station, computer center, student lounges, a new 10,000 SF multimedia services center and a 20,000 SF building addition. The BIC project also included renovation of existing two-story laboratory space, which formerly housed the manufacturing, welding, HVAC, and automotive laboratories, into a new loading dock, warehouse, offices, shop space, and miscellaneous staff areas. The renovation also included replacement of the existing building electric service equipment, a new standby emergency power system, complete new HVAC distribution using existing air handling units, and new plumbing and fire protection systems throughout the facility. The SRC project focused on improving circulation, reorganization of administrative/office space and consolidating Culinary Arts activities and Student Affairs/Activities. The culinary arts department features spaces for instructional classroom, test kitchen with hot and baking labs with equipment suitable for hands-on learning, walk-in coolers and freezer along with dry food storage spaces are integrated through the space and office space for culinary instructors. Extensive coordination was required as both buildings remained operational during construction.

- Chicago Athletic Association – The project involves the renovations of the historic Chicago Athletic Association into a boutique hotel. The property consists of two buildings, 12 South Michigan Avenue and 71 East Madison Street, for a combined total of 225,000 SF. The hotel includes approximately 225 guestrooms, banquet and meeting spaces, full service kitchens, retail, and fitness areas. The first phase of the project consisted of a facility assessment to determine the potential for reuse of current infrastructure, as well as a narrative describing MEP system options to support the new program. Phase 2 involves full design and construction administration activities. The building presents a number of unique challenges including working within spaces of historical significance that require the installation of HVAC, electrical, and fire protection systems in addition to a fast track design schedule. The general contractor was selected early in the

process to work together with the design team to provide pricing and input during the design phase of work. The services provided on this project were Construction Administration, Electrical, Fire Protection/Detection, Mechanical, Audio Visual, Telecommunications, and Security.

- Benedictine University – 150,000 SF new business classroom building offers a high-tech, multi-story facility for a new learning environment, including seminar rooms, 600-seat conference center, departmental offices, art gallery, trading floor lab, and the College Business' internationally recognized doctoral programs. The services provided were Acoustic, Assessment, Construction Administration, Electrical Fire Protection/Detection, Mechanical, Investigative, Audio Visual, Telecommunications, and Security.

Nicholas has developed strong skills and proficiency in both management and instruction within a variety of diverse and technically challenging environments. Throughout his employment, he has gained the ability to plan and execute various projects effectively and creatively while maintain client images and working within strict time lines. Nicholas has demonstrated expertise in the area of audio, video, structured cabling, and security systems integration, acoustics, operational management, and customer service. He also specializes in the design of audio visual systems primarily for sports, recreation, education, and healthcare institutions. Through collaboration with clinicians, educators and technical staff, Nicholas is able to determine operational requirements for integrated audio visual systems to support presentations, distance learning, and digital signage applications. Additionally, he has experience with industry specific software such as AutoCAD, REVIT, and EASE, as well as experience with the Microsoft Office Suite. With the complexity of available technology, Nicholas has shown that his experience in the development of design standards for performing arts, educational institutions, and healthcare facilities in addition to the commissioning of completed installations is a valuable asset to Technical Design Services, Inc.

Brian Hansen, RCDD, NTS ***Senior Technology Consultant***

Brian Hansen has joined our firm as a Director of Business Development. Brian will also function in the role of project manager and lead technology consultant on a number of our high profile projects. Brain was formerly a Specification Engineer for Leviton Network Solutions covering 9 states the North Central Region and is a BICSI RCDD & NTS. Hansen has been in the Telecommunications Industry for over 31 years in which he has been a Consultant, Contractor and Network Engineer. He has significant experience with data center design, cabling systems specification development and industry standards compilation.

Hansen is currently the Past President of BICSI, a non-profit organization based out of Tampa, Florida serving the Information Technology Systems industry with over 23,000 members in over 100+ countries around the globe. Prior to that, he served as the BICSI President and President-Elect for one term each, Treasurer for one term and the BICSI North Central Region Director for two terms. He is also active as a member of the RCS Committee, where he has served for over 20 years.

Hansen formally served as the chair for the Green Building Technology Alliance (GBTA), which he formed in 2006. GBTA's charter was to create Innovation and Design Technology Credits for the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) green building certification system. He also served on the STEP® (Sustainable Technology Environments Program) Foundation Board of Directors representing BICSI as the member at large. Hansen was also the Chair for the BICSI STEP Committee, which was formed in 2012.

Some of Brian's recent project experience includes:

- ***United Airlines –*** Assisted in the development of products used throughout the organization
- ***Mayo Clinic –*** Work with the leads in the IT department to develop the information technology infrastructure standards and specifications to be used though their facility(s)
- ***Major Networking Equipment Manufacturer –*** Work with the lead IT department to develop the information technology infrastructure standards and specifications along with particular product sets and installation methodologies to be used though their facility(s)
- ***Additional project references available upon request…***

Brian's proven ability to prosper in leadership function requiring analytical and creative talents within a challenging and fast-paced environment, superior knowledge with account management procedures, and being well versed in telecommunications building wiring standards have led to having built solid relationships where he has been able to share his technology design knowledge and construction wisdom. Brian has worked as a Manufacture, a contractor, and consultant giving him a well-rounded skill set and unique approach to developing project solutions.