Berkley Schools

Comprehensive Academic Spaces, Facilities and Technologies Needs Assessment

ids Project No. 13197-1000

Berkley Schools Board of Education

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March 2014

comprehensive academic spaces, facilities and technologies needs assessment

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Overview

Integrated Design Solutions, LLC (**ids**) was commissioned by Berkley Schools to conduct a needs assessment of nine (9) school buildings within the Berkley School District (BSD) for the purpose of obtaining a comprehensive academic spaces, facilities and technologies needs assessment. Each facility, including educational spaces and technology systems, were surveyed between October 21, 2013 and January 21, 2014. Building systems were thoroughly evaluated with the assistance of BSD building facility and supervising personnel and historical data. The **ids** survey team consisted of senior level individuals with extensive knowledge in each of the facility categories surveyed.

Academic spaces were evaluated with the assistance of BSD supervising personnel and a specially selected Building Level Committee comprised of both BSD staff and community members that included 10 separate educational assessment meetings. These meetings were held at each building.

Technology systems were evaluated with the assistance of BSD technology staff. Eight (8) separate meetings were held to discuss and evaluate technology systems and services. These meetings included 85 distinct K-12 technology structures clustered into 8 general content areas.

Additional meetings were conducted to evaluate the educational impact of the systems evaluation and how they support or inhibit instructional systems in the district. Outcomes in this report are aggregated from building site visits and technology infrastructure head end rooms, combined with the suggestions and 21st century visioning from the Academic Spaces discussions as part of the overall assessment process.

The following report compiles a list of all deficient building, mechanical, electrical, life safety, academic space, barrier free and technology items discovered that, in our professional opinion, would require replacement, enhancement and/or repair in order to meet the goal of preserving the assets of each facility. Itemized deficiencies were not meant to change the facilities special layouts or functions. Items excluded from the report include furnishings, window treatments, leased and tenant areas, playscapes and playground equipment, and hazardous material remediation.

The **ids** survey team evaluated each deficiency discovered during the survey and assigned an overall score based on three factors: the consequences of the problem, frequency of the problem and the need. The consequence of the problem ranks each item in terms of its critical nature. This ranges from the most critical items that are considered to be a potential hazard to the least critical, such as a condition that reduces the functional utility of the facility or results in extensive energy consumption. The frequency of the problem ranks each item relative to its frequency of use such as classrooms or public areas used daily to the least often used areas such as mechanical rooms. The need of the problem ranks each item from the most critical, those that if not accomplished, will result in serious and irrevocable loss or damage, to those that are desirable or necessary. The sum of these three factors results in the overall score, where the lowest numerical number relates to the highest priority.

Deficiency costs were summarized for all buildings. It was determined that approximately 4 percent were of a low score (Priority 1 - a numerical score of 5 or less). These deficiency items are those considered to be a potential hazard or interruption of essential services and are of a critical or urgent need.

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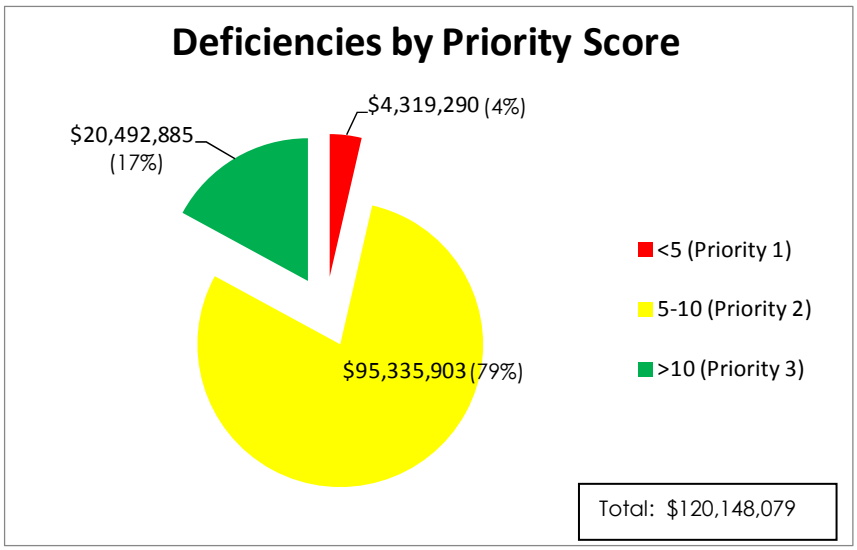
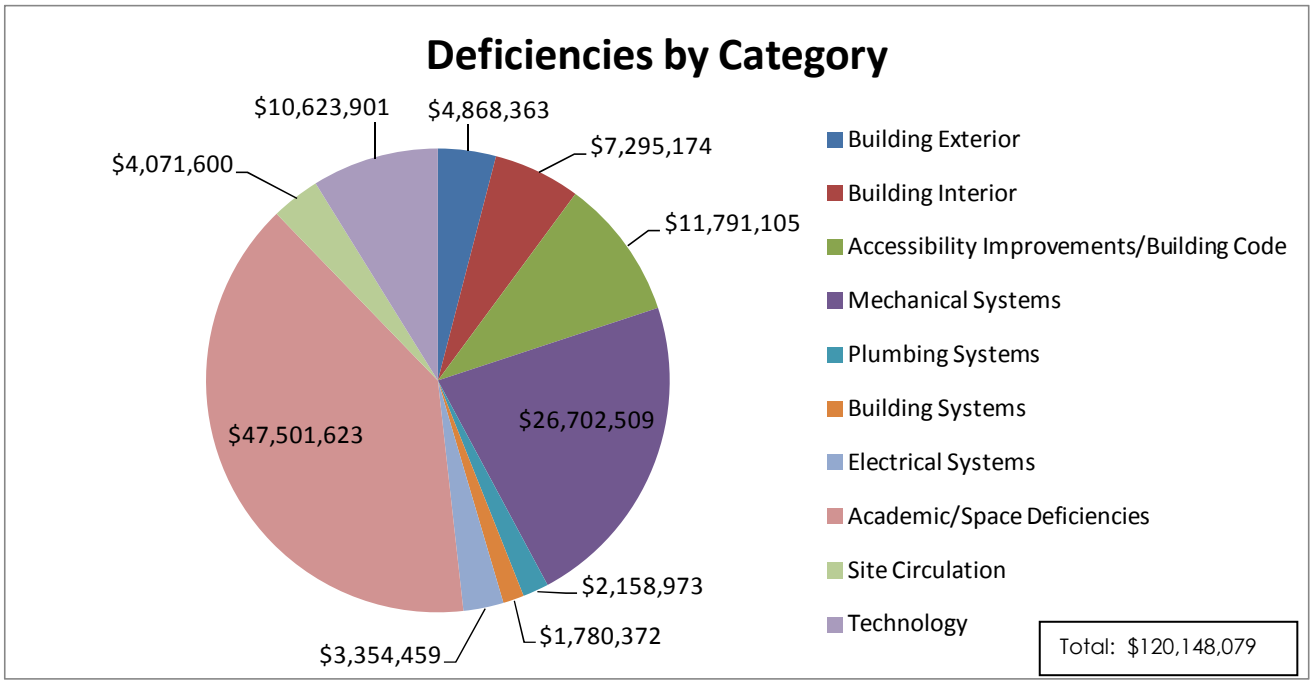
Approximately 79 percent of all deficiency costs for all buildings are of a moderate score (Priority 2 - a numerical score from 6 to 10). These deficiency items generally include conditions causing premature deterioration and are necessary, but do not have an urgent need.

The remaining 17 percent of all deficiency costs for all buildings have the highest score (Priority 3 - a numerical score from 11 to 15). These deficiency items generally include conditions that may reduce the functional utility of a facility or result in excessive energy consumption and are considered desirable.





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Scope of Report

This report consists of the following information:

- Summary of all buildings, with respective deficiency costs, general deficiency findings in the following 3 main categories: Academic Spaces, Facilities and Technology. Current replacement value and facility condition index for each building is based on Michigan Department of Treasury Bond Authority and industry accepted estimating resources. All implementation costs will be based on a separate and competitive bidding process.
- General information related to the report parameters and methodology.
- Minimum code and barrier free requirements.

For each building, the following information is provided (refer to Tabs 3 thru 12):

- Present use and vital statistics of each building.
- A spreadsheet listing each deficiency organized by the priority score of the item with cost estimates to correct each of the identified deficiencies in the following categories:
  - Building Exterior
  - Building Interior
  - Accessibility Improvements/Building Code
  - Mechanical Systems
  - Plumbing Systems
  - Building Systems
  - Electrical Systems
  - Academic/Space Deficiencies
  - Technology
- Graphic charts displaying the percentage of deficiency cost broken down by priority score and by building categories.
- Key plans of each building.
- Photographs that document existing systems and areas of deficiencies.

The deficiencies outlined in this report were the result of visual inspections by **ids** staff and/or information obtained from Berkley School's facility, technology and maintenance personnel directly responsible for the respective buildings. The inspections were not intended to be invasive and generally do not include items beyond the surface of floors, walls, ceilings or building systems.

The results above are the culmination of 5 full months of data gathering, which included user group interviews, facility personnel interviews and document investigations by senior level architects, engineers and technology specialists consisting of a six-person team and physically surveying 100% of the district educational space by a 3-person senior level facility audit team.

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Estimated costs are itemized by architectural, mechanical electrical and technology trades and are totaled under Construction Costs and include the following additional mark-ups:

	General Trades	Technology
• Design Contingency	5%	10%
• Construction Contingency	10%	5%
• Subcontractor Mark-up	15%	---
• General Conditions	10%	---
• Construction Manager Mark-up	2.8%	---
• Owner's Representative	1.5%	---
• Architectural and Engineering Fees	6.5%	5.5%
Total	**50.8%**	**20.5%**

Estimated costs are for the current year (2014), inflation rates of 2.5 percent per year should be used to adjust the cost estimate annually. In some cases, due to the nature of the work, quantities were estimated and assumptions made in order to establish the course of action. Further development and investigation during future implementation phases will be necessary to determine a more accurate scope of work and more precise budget estimate. All implementation costs will be obtained through a competitive bidding process as dictated by Berkley School Board policies and guidelines and the Michigan School Code.

Hazardous Materials

Cost of hazardous material remediation is not included in the deficiency costs. The District is responsible for identifying and estimating these total costs. This cost should be added to the total deficiency cost for planning and budgeting purposes.

Academic Spaces Deficiency Findings

General Deficiency Findings

The following is a summary of the information garnered from the academic assessment meetings held at each school during the information gathering phase of the comprehensive academic spaces needs assessment for Berkley Schools. While each school had specific needs, a majority of the needs identified were consistent across the district.

Educational needs are broken down into 6 categories; classrooms and labs, fine arts, science, auxiliary spaces, support spaces and technology.

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Common needs consistent across the District are as follows:

Classrooms and Labs

In every school within the District classrooms are small compared to today's standards. The sizes of the classrooms are often dictated by the room depth, specifically the distance from the corridor wall to the exterior wall. Ideally this measurement should be around 30 feet. In most schools this dimension ranges between 22 feet and 24 feet. This typically means any renovation to increase the classroom size to an appropriate square footage would make the rooms very long and narrow which would significantly compromise its effectiveness as a classroom. Any renovated or new classroom needs to be flexible, this can be achieved by making rooms large enough to accommodate different learning zones or by utilizing furniture that is easily moved and rearranged.

Fine Arts Category

Fine arts are offered in each of the schools within the district and in addition to traditional art classes this includes both band and orchestra classes. These classes are often held in classrooms, or in shared spaces with a different primary use and in all locations acoustics are an issue. Currently the spaces used for music education are not designed acoustically for their use, or for storage, or isolated from adjacent classrooms; this relationship between music education and standard classrooms has a significant impact to the adjacent and nearby learning spaces as instrument noise spreads to these rooms. Creation of dedicated music educational spaces will vastly improve the quality of learning for both the fine arts areas and classrooms. Additionally, this will free up the current art spaces for new uses such as sensory, kindergarten, work, storage and storage rooms, etc.

Science Category

While there are dedicated science labs at both Anderson Middle School, Berkley High School and Norup International School, science is taught in general classrooms at all other elementary schools. Often, storage of science materials and learning aids is spread throughout the school, making retrieval of these materials cumbersome and negatively impacts instruction. Creation of shared Science Labs at the elementary schools will be an effective way of providing an appropriate learning environment while gaining the necessary storage space.

Auxiliary Spaces Category

Auxiliary spaces include athletics, cafeterias, multi-purpose rooms, and any other learning space that is not a dedicated classroom or lab. In each of the elementary schools, as well as Anderson, the only auxiliary space is the gymnasium. This space functions as a gym, cafeteria, auditorium, student assembly, and a miscellaneous storage space. Every school in the district has requested a multi-purpose collaboration space that can be used for large group instruction. This type of space should be large enough for 2 to 4 classrooms at one time and be available for use throughout the day without disrupting normal activities in adjacent classrooms, gymnasium or cafeteria. Based on the current usage of the auxiliary spaces (gymnasiums) this type of pedagogy is not currently supported. The addition of a dedicated cafeteria and large group instructional space will greatly improve the quality of learning and eliminate scheduling issues by creating spaces designed specifically for their use.

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Office Category

In every school, the main office is separated from the primary entry and/or primary parking lot. This was brought up as a security issue at every educational assessment meeting. In all but two of the buildings, offices don't even have a view of the entry, and in many cases are in remote parts of the building. The office should be relocated to the main entry to improve access control and security.

Technology

Every school requested interactive technology in the classroom including WiFi for staff and student use. There are interactive whiteboards in a few classrooms in some of the schools, but not everywhere. Projection technologies, types and quantity of computers and other technology varies from building to building, room to room. As important as it is getting interactive technology into all classrooms, making the technology easy to use and consistent between classrooms is just as critical.

School Specific Needs

Refer to comprehensive academic spaces, facilities and technology needs assessment spreadsheets located under Tabs 3 through 12.

Facilities Deficiency Findings

Building Exterior

Water flowing off of sloped roofs without gutters has resulted in brick staining and deterioration of brick at grade. In addition, poorly draining sites cause this roof run-off to pond along the exterior walls and penetrate into interior spaces causing damage.

Building overhang soffits of painted steel are typically peeling and rusting. Also wood covered canopy soffits are generally in poor condition.

Exterior windows replaced in 1995 are thermal-broke aluminum with insulating glass. Many suffer from poorly performing operational hardware, but replacement for that issue alone would not be cost effective. Replacement of windows is suggested at locations that utilize casement-style windows due to inability to obtain replacement parts.

Sealant at the perimeter of door and window openings, approaching 20 years of use is cracked and separated in many locations and should be replaced.

The quantity of building roof replacement was determined from information obtained from the 2010 District Wide Roofing Survey and Analysis conducted by Testing Engineers and Consultants. All roof areas rated fair or worse in the analysis were assumed to need replacement in the next ten years.

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Site Circulation

At all of the schools in the District, parking is limited and student drop-off can create problematic and unsafe conditions for both drivers and pedestrians. This is due to the fact that schools are located within neighborhoods with a limited amount of area to accommodate these functions. Each school has unique conditions related to parking and traffic, but all of them are in need of additional parking and safer student drop-off.

Building Interior

Carpet typically installed in 1995 is in fair condition and it is assumed that corridors will need replacement within five years.

Plastic laminate counter tops are delaminating in wet areas adjacent to sinks. Original casework cabinets are in poor condition.

Original 12 inch square ceiling tiles at sloped classroom ceilings are in poor condition.

With the exception of portions of building where additions and renovations occurred in 1995, most interior doors and frames are original with poorly functioning, out-dated hardware. Doors typically lack required fire ratings, closers and proper safety and/or fire rated glazing.

Accessibility Improvements/Building Code

Many updated barrier free toilet rooms lack the required maneuvering space at entrance doors and related code required devices.

Several buildings have items stored in the corridors that are in violation of the fire code.

Many stairs lack current code required handrails and guardrails and in some locations stairwells do not have fire rated enclosures or fire rated separation at a minimum of one of the floors.

Some classrooms lack the proper quantity and physical separation of exits based on their size and use.

HVAC

All of the buildings in the District utilize a local heating plant (Boiler Room) that produces either low pressure steam (5-10 lbs.) or heating hot water. Six of the schools have boilers original to the school that are all between 47 and 60 years old. These plants are very inefficient and can be expensive to maintain depending on the availability of parts and laborers that have the experience to work on such old equipment. These plants are in poor condition due to the age of the equipment. There are large quantities of missing or damaged pipe insulation.

There are no cooling plants in the District. There are no chillers in the District.

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Portions of each school are air conditioned via direct expansion (DX) packaged rooftop units or window air conditioners. Generally the office area and media center are air conditioned in every school. Avery and Tyndall are completely air conditioned because they are presently used for year round office space and childcare.

The majority of the classroom spaces are served by heating and ventilating only horizontal through wall unit ventilators that are in poor to very poor condition. Gymnasiums and common areas are served by indoor heating and ventilating only units that are fair to poor condition. During the 1995 renovations, several heating and ventilation roof top units were either added or replaced. These units are now 18 years old and are in fair condition. The average expected life of a light commercial grade rooftop unit in this climate is 15 years.

Plumbing

The majority of the domestic water pipe is galvanized steel. Older galvanized pipe has the tendency of delivering rust colored water after just short periods of stagnation. Although safe to drink, overwhelmingly occupants do not drink from the water in the building. Many drinking fountains flow warm water and are in some state of disrepair.

Many of the toilet fixtures are of the age that newer flush valves do not fit or work with them. Floor mounted wall urinals have traps that are direct buried in the soil and may not be intact. Based on the age of the pipe, there are reports that waste is discharging into the soil. The original toilet rooms are in poor condition.

Sanitary and storm pipe is primarily cast iron original to the building and is considered to be in fair to poor condition based on its age.

Fire Protection

There are very few areas in the district that are sprinkled. Shops or repurposed shops are sprinkled with dedicated fire protection lines piped from the domestic water system. There are no fire pumps in the district. Kitchen hoods are protected by a locally controlled chemical discharge system.

Temperature Controls

The District uses primarily pneumatics for building temperature controls. This type of controls system has been phased out over the last four decades in favor of Direct Digital Control (DDC) Building Automation Systems. DDC systems enable users to monitor and control their buildings more precisely over the web. These systems use low voltage control signals, computers and software to operate building equipment, specialty equipment, lights, etc.

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Building Systems

The fire alarm systems were installed in 1995 and are difficult to maintain. The system provides zone coverage which has been made obsolete by addressable fire alarm systems which monitor each device individually. The addressable system also displays the location and type of device if dirt, damage or other non alarm condition occurs which affect the readiness of the system.

The emergency egress lighting system was installed in 1995 with the replacement of corridor ceilings and new lighting. Individual emergency battery units were installed in selected fixtures to provide the egress lighting. More strict enforcement of the egress lighting requirements now require that additional fixtures have emergency battery units.

Electrical Systems

With the exception of the service entrance upgrades for the technology renovations installed in 1995, the building electrical distribution systems are mostly original. Since this varies from the 1920s through the 1950s, this equipment is obsolete and in many cases are potentially hazardous. These panels should be replaced.

General power branch circuit panels which serve classrooms are generally 'full' with no spare fuses or circuit breakers to serve additional loads. Branch circuit panels are frequently located behind classroom doors in violation of the current electrical code. New, larger circuit breaker panels should be provided.

Some buildings have original fluorescent lighting fixtures which are obsolete.

Some buildings have older exterior lighting fixtures at building entries which should be replaced.

All buildings except the high school, have DTE Energy provided lighting for the parking lots. This provides poor quality illumination at low levels. New poles with LED fixtures and underground wiring would improve the aesthetics and illumination levels.

Structural Systems

The option to add second floors to many of the schools was brought up during our academic analysis sessions. This was due to both the need for more space and the limited amount of area available for expansion at all of the schools. Based on analysis of the structural systems for the schools, adding a second level to the one story portions of the schools is not possible. There are two components to the structural systems of the schools that contribute to this. First, the roof framing and columns at each of the schools are minimally sized to handle only the structural loads related to roofs, such as snow loads, and would not be able to handle the weight of an additional floor. In fact, many of the roofs over the one story schools are sloped which would also require complete replacement of the framing system. The other parts of the structural system unable to handle the addition of a second floor are the building and column foundations. Like the roof framing, the foundations under the exterior walls and under every column are minimally sized to handle only the loads related to roofs. In order to increase the load capacity of both the foundations and framing system to handle the weight of a second floor, virtually all of the existing building would need to be demolished.

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Addition and Renovation Constraints

Due to the fact that adding second floors to the building is not possible, the open areas adjacent to the buildings are the only spaces available for building additions. In most cases, these areas are already utilized for either playground, student drop-off, or parking. This means that any future expansion of playground space, increase in parking spaces, improved student drop-off zones, and building additions may be in conflict to one another.

Other Spaces

The other spaces category include spaces such as storage, sensory rooms, teacher lounges, and other miscellaneous space needs that may not be common to all schools. Many schools lack a dedicated sensory room and are in need of one. Teacher lounge space is often nonexistent or lacking when available. Storage, both building storage and classroom storage, at each of the schools is limited. In most cases, these miscellaneous spaces can be accommodated in additions proposed for dedicated fine arts wings, or be placed in the spaces vacated by its construction.

School Specific Needs

Refer to comprehensive academic spaces, facilities and technology needs assessment spreadsheets located under Tabs 3 through 12.

Technology Deficiency Findings

The K-12 technology structures were clustered into eight (8) general content areas which follow. The technology assessment findings are reported as District-Wide Technology in Tab 12. A distribution of the overall technology project costs are distributed to each building, listed as **Technology Total** at the bottom of each building's comprehensive academic spaces, facilities and technology needs assessment spreadsheets.

Video/Audio Systems

Many of the previously installed 32"CRT TV sets have been removed while 70-80% of the classrooms have instead installed projectors. The Rauland clock system does not provide adequate viewing in all spaces and needs manual adjustments periodically. The same system, installed in each building in 1995, provides PA ability including the bell and safety warning signals. Old and failing wiring makes some of the functions unreliable. System reboots are unstable at times. Free field (audio enhancement) in classrooms was originally installed in 1995 in elementary classrooms and secondary large group instructional areas. The system components are difficult to replace and budgets have dictated the decisions to upgrade or replace failing hardware in all schools. Headend modulators to distribute video building wide have failed and due to old components, have not been able to be repaired. Wiring and infrastructure issues also make video distribution impossible in some buildings without substantial upgrading. Video editing equipment and designated production and editing facilities installed in 1995 have been disbanded with limited replacement in most areas. Each building has a standard but minimal set of video surveillance cameras with limited storage of footage.

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Phone Systems

The digital Ericsson phone system was installed in 1997 utilizing three different types of handsets which are next to impossible to replace in today's market. Frequent failures and repairs cause the system to be highly vulnerable at times. District voicemail capabilities are adequate. System replacement is necessary in order to comply with the 2016 E911 preparedness which includes the ability to disclose specific call location data to PSAP operators. POTS lines exist for FAX machines and serve as emergency phones during power outages. Individual buildings are not equipped with generators to back up the phone system. Guardian Alarm provides security services to the district via the phone system.

District Headend

Sanyo AC equipment in the district and school headend rooms is poorly mounted, hanging in some locations over technology equipment. New split systems have been installed in four buildings. Swamp coolers in headend rooms take up valuable space for other hardware. Some UPS battery backup systems are in place with varying stability. District headend electrical panels have been captured for other projects which presents problems for the technology equipment. Power company fuse panels periodically fail causing phasing or power outages. No fire suppression system is installed in Avery or Anderson headend rooms which house central district hardware. No generators are available to back up major equipment in times of power failure.

Hardware

The district has nearly 1,100 desktop units, primarily Dell products. Teacher workstations are converted to Windows 7 from XP. There are 180 laptops and 240 netbooks of varying ages and manufacturers in use in the schools. While carts may house the computers, not all are equipped with wireless connectivity which limits their flexible use. The district's 500 iPads are deployed one per classroom and other small sets for special programs. One 5th grade classroom is piloting one-to-one iPads. Alternative education programs utilize netbooks for blended and seat-time waiver credit recovery programs. There are also sets of Nooks, Chromebooks and other tablets being piloted in schools and classrooms. Most printing is completed via black and white network printers and district Ricoh copiers. There is no virtualization in district. Many buildings utilize Smart Carts for portable computer, scanner, and projection capabilities using various equipment and specs.

Network Infrastructure and Wireless Systems

Two schools are fully wireless with Aerohive access points. Classrooms have twelve data drops. AP power is provided by 48-port injector rack with no POE switches available. iBoss content filtering is used for managing internet access. Novell 6.5 within the district is outdated. Without active directory, the district's options for many other solutions are limited. Cellular coverage in schools poses issues in some locations. The network core is 10/100, running very slow for imaging and other network usage. Wiring is Cat5 or 5e, with no Cat6 wiring in the district. A 2008 Fortigate 200B firewall by CoreGuard protects the district. There is a guest network for BYOD access. The anti-virus system is Symantec and Avast products. Desktop computers use DeepFreeze. The district's 7 miles of fiber were installed in 1998 by FiberLink where most is above ground. Recent damage to sections of fiber caused by the elements or breakdowns in overlash caused extended outage and repairs.

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Server Systems

EqualLogic storage server has 12 one-terabyte drives for a capacity of 6.5 TB, installed in 2012. The district runs 3 Dell PowerEdge 2950 servers for Netware 6.5, network programs and Suse Linux 10 for DNS services. Students are allocated 500 MB of storage. The district currently runs GroupWise on VM technology at Oakland Schools. Ghost is used to image systems with limited capacity. Local SAN does not accommodate adequate file recovery. The district finance and student information system Skyward runs on leased VMware servers at Oakland Schools. Current overall SAN capacity does not meet the storage or recovery needs of staff and students.

Administrative Systems

Skyward Finance and Student Information System is used widely across the district for over 12 years which includes special education, food service, report cards and grade reporting modules. Growth of other available modules including RTI, more Human Resources functions and enhanced special education functions are desired. Skyward is fully compatible with state reporting needs for uploads of data and filing of reports. Media circulation uses Follett Destiny software at all buildings. The district's transportation for special education, athletic and field trip needs are supplied by outside agencies as there are no buses owned by the district. Aramark is contracted as the food service provider with the main hub located at Berkley High School. Food is prepared there with delivery to each school where serving kitchens are located. District work tickets for technology are managed and tracked using Big Web Apps, while custodial maintenance tickets utilize School Dude software. Door entry control is a standard key fob access system in each building, centrally managed by the district. District wide messaging is widely used in the Skyward School Messenger systems. The district's website is hosted by LTGI Lindner Technology Group while being managed by district personnel.

Interactive Systems

Interactive whiteboard use and installation varies across the district as some are mounted in classrooms and instructional spaces while some remain portable. One school has installed interactive Smart projectors, displacing the need for stand-alone boards with projectors. There are some old student response systems used periodically within the district.

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Deficiency Summary

Table 1.1 "Facility Condition Index" lists the deficiency cost (DC) estimates and current replacement value (CRV) for each building. The facility condition index (FCI) number indicates the level of deficiency for each building. This number is arrived at by taking the deficiency cost and dividing it by the current replacement value. The FCI method was developed by Applied Management Engineering of Virginia Beach, VA and was published in 1991 by the National Association of College and University Business Officers (NCUBO) in *Managing the Facilities Portfolio*.

Table 1.1 Facility Condition Index

Building	Original Square Footage	Deficiency Cost[2]	Adjusted Square Footage[1]	Current Replacement Value[3, 4]	Facility Condition Index (FCI)
Anderson Middle School	95,908	$14,007,996	132,075	$39,358,350	36%
Angell Elementary School	40,981	$10,658,461	65,622	$19,555,356	55%
Avery Center	37,307	$5,299,079	44,768	$13,340,864	40%
Berkley High School	227,326	$23,585,855	301,391	$89,814,518	26%
Burton Elementary School	48,272	$12,197,798	74,371	$22,162,558	55%
Norup International School	89,603	$27,127,795	132,089	$39,362,522	69%
Pattengill Elementary School	46,314	$11,285,731	72,022	$21,462,556	53%
Rogers Elementary School	37,222	$10,690,131	61,111	$18,211,078	59%
Tyndall Center	24,633	$5,295,234	29,560	$8,808,880	60%
Totals	**647,566**	**$120,148,079**	**913,009**	**$272,076,682**	

1 Existing building square footage adjusted to include deficiency square footage, which includes new academic spaces and larger classroom sizes.

2 Deficiency costs include new academic spaces, but not enlarged classrooms.

3 Current replacement value is based on the Michigan Department of Treasury Bond Authority allocation of $209.00 adjusted to $235.00 per square foot to accommodate the following items:

- Demolition
- Land acquisition
- Site development
- Temporary facilities
- Project phasing

4 Replacement value includes additional mark-up of 30% for:

- Design contingency
- Construction contingency
- Subcontractor mark-up
- General conditions
- Construction Manager mark-up
- Owner's Representative
- Architectural and Engineering fees

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The FCI uses empirical data to benchmark relative measures of conditions in the District. The FCI values are assessed as follows:

- FCI value less than 5% = Good condition
- FCI value 5% – 10% = Fair condition
- FCI value greater than 10% = Poor condition

Based upon these FCI values, all buildings are in poor condition. Burton Elementary School, Angell Elementary School, Rogers Elementary School, Tyndall Center and Norup International School have the most immediate need for replacement work, as they have the highest FCI values ranging from 55% to 69%. These values are primarily driven by the high cost of building and mechanical infrastructure upgrades and equipment replacement costs.

This report recommends upgrades that are long-term goals. The FCI values should not be construed as meaning an entire building is deficient, rather, over time, the maintenance and upgrades have not kept pace with comparable facilities of the latest design and engineering.

Conclusions

The results of this report show that approximately 4% of all deficiencies ranked as critical or urgent in need, approximately 79% of all deficiencies ranked as moderate in need and the remaining 17% rank as items that reduce the functionality of the facility and will soon be moderate or critical in nature. In dollar values this equates to $4,319,290, $95,335,903 and $20,492,885 respectively.

Nearly 100% of Berkley's technology infrastructure is well beyond its useful life. Over 63% of Berkley's loose technology equipment is at or beyond its useful life. There is approximately $10,623,901 in total technology deficiencies.

The results above are the culmination of 5 full months of data gathering, which included user group interviews, facility personnel interviews and document investigations by senior level architects, engineers and technology specialists consisting of a six-person team and physically surveying 100% of the district educational space by a 3-person senior level facility audit team.

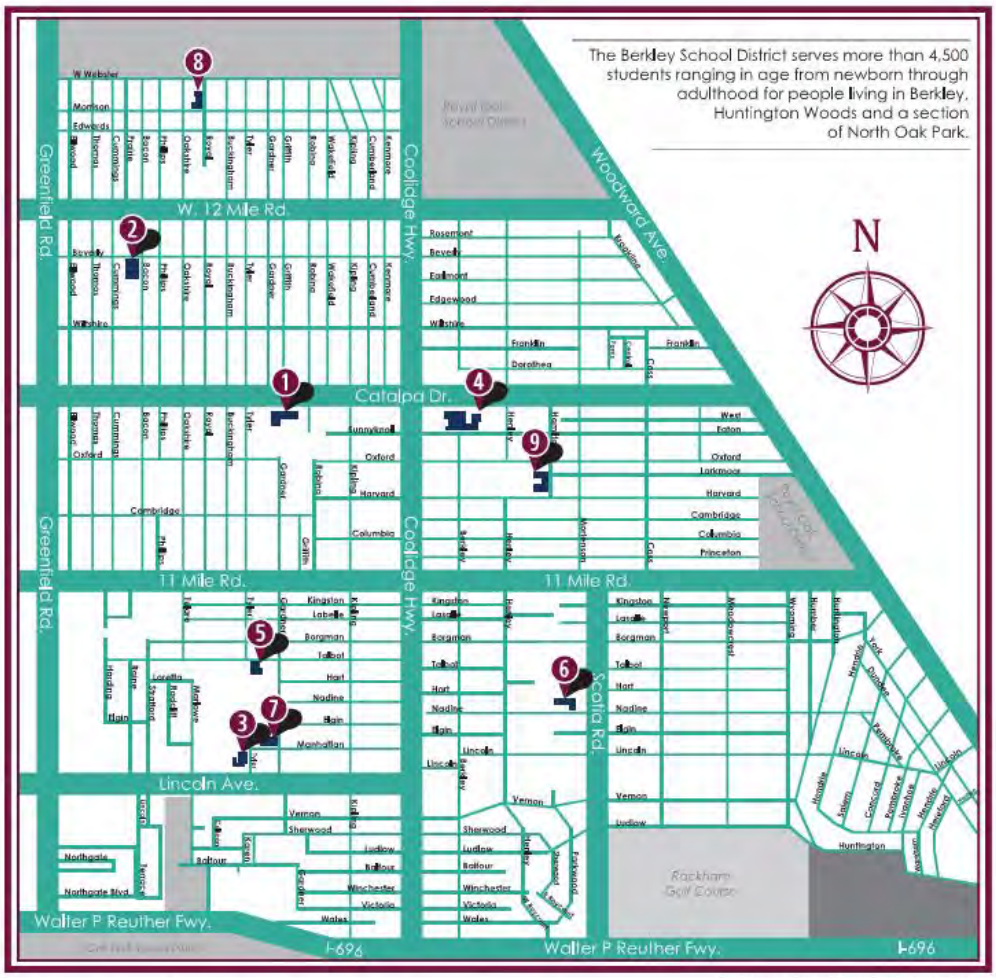
This independent assessment will serve as a tool to help guide the District's capital project decisions and is not intended to be a design template or bond proposal document.

Project Team

Larry Hamilton .....Architectural
Matt Beck.....Architectural
Bruce Snyder .....Mechanical
Tom Hackett .....Electrical
Steve Shotwell.....Technology
Ken Crawford.....Technology

ASSESSMENT REPORT GENERAL INFORMATION

Location Map



ASSESSMENT REPORT GENERAL INFORMATION

Facility Assessment Team

Integrated Design Solutions

Larry Hamilton	Architectural
Matt Beck	Architectural
Bruce Snyder	Mechanical
Tom Hackett	Electrical
Steve Shotwell	Technology
Ken Crawford	Technology

Facility Contacts

Berkley Schools – Executive Committee

Dennis McDavid
Larry Gallagher
Mary Beth Fitzpatrick
Jeffery Montgomery
Chris Sandoval
Jessica Stilger
Rodney Fisher

Berkley Schools – Building Level Committees

Building Custodian
Building Engineer
Community Member
Executive Member
Media Specialist
Principal
PTA Member
Special Education
Support Staff
Teacher

Resource Information

- Copies of construction documents of each building for recent additions and renovation project.
- 2010 District-Wide Roofing Survey and Analysis – Testing Engineers and Consultants, Inc.
- Berkley School District 2010 Roof Replacement Program Close-out Documentation and Warranties – Testing Engineers and Consultants, Inc.
- Technology inventory, network map, phone system installation documents
- Vision 2020 strategic plan

ASSESSMENT REPORT GENERAL INFORMATION

Assessment Report Format

The following facility assessment reports have been organized by building category and evaluated by priority comprised of the Consequence, Frequency and Need of the problem.

For additional information on the evaluation categories, please refer to the Building Deficiencies Priorities by Category explanation on the following page.

Estimated costs for each item are broken down by architectural, mechanical, electrical and technology trades. The totals are 2014 project costs and include sub contractor and construction manager mark-ups, design and construction contingencies, and architectural and engineering fees totaling 50.8 percent for general trades and 20.5 percent for technology. Inflation rates of 2.5 percent per year should be used to adjust the cost estimate annually.

In some cases, due to the nature of the work, quantities were estimated and assumptions made to establish the course of action. Further development and investigation during the implementation stage will be necessary to determine a more accurate scope of work and a more precise budget estimate. The mark-up percentage may also require adjustment to reflect how a specific project may be performed, such as a smaller project where a construction manager may not be involved or when work is performed by Berkley Schools staff.

Building Deficiencies Priorities by Category

Consequences of the Problem

1.	Potential Hazards:	Presents potential hazards to life, health or safety.
2.	Interruption:	Potential for interruption of essential services or lack of parity.
3.	Deterioration:	Conditions causing premature deterioration.
4.	Utility:	Conditions that reduce the functional utility of the facilities.
5.	Energy:	Conditions which result in excessive consumption of energy.

Need

1.	Critical:	If not accomplished, will result in serious and irrevocable loss or damage.
2.	Urgent:	If not accomplished, will shortly deteriorate into a Category 1 position.
3.	Necessary:	If not accomplished, may jeopardize the continued usefulness of the facility.
4.	A.D.A.:	Projects necessary to improve/meet barrier free accessibility needs.
5.	Desirable:	All remaining projects necessary to renew or restore the facility.

Frequency of Use

1.	Constant:	Classrooms, offices, central heating plant, technology, etc.
2.	Frequent:	Auditorium, laboratories, libraries/media centers, small/large group instruction, staff work room, toilet rooms, etc.
3.	Occasional:	Public and common spaces, athletic fields, fitness centers, etc.
4.	Infrequent:	Storage, etc.
5.	Meager:	Dead storage/other

Note: the above definitions are not intended to be used verbatim but rather as a general indicator of ranking.

ASSESSMENT REPORT GENERAL INFORMATION

Replacement Values and Procurement

Replacement values are estimates based on the Michigan Department of Treasury Bond Authority and industry accepted estimating resources. All implementation costs will be obtained through a competitive bidding process as dictated by Berkley School Board policy guidelines and the Michigan School Code.

Code and Barrier Free Requirements

Building and barrier free codes have changed extensively since many of the buildings in the District were constructed. Attempting to apply today's codes to buildings of this era is not always practical, but nonetheless, provides a benchmark to evaluate existing conditions. While there is no code mandated requirement to bring an existing building up to current code requirements, any new or renovation work would be required to meet most current codes. In addition, renovation work involving an excess of 50 percent of the building's area would trigger a total building code update including barrier free. Contributing factors that make current code compliance problematic include limitations imposed by existing infrastructure that may prevent or make code compliance extremely difficult, both physically and monetarily. As a result, it may be necessary to consider equivalent code measures or combinations of code systems to achieve a desired life safety improvement or code compliance objective.

In addition to the Michigan Barrier Free Design Code, which generally comes into play when there is renovation or new work, there are continuing obligations under the Americans with Disabilities Act (ADA) to remove barriers. The ADA is a civil rights act, not a code or standard and therefore, no agency verifies compliance. The Act expects compliance with the intent of the Act, which is to eliminate discrimination of the disabled. Portions of the buildings that are accessible to the public and students fall under the "public accommodations" classification. These areas are governed by Title III of the ADA that requires the facilities owner to make "readily achievable" changes that are in compliance with the ADA. The barrier free noncompliance issues in this report are generally based on full compliance to all requirements, although for reasons stated above, removal of all barriers may not be required at this time.

ASSESSMENT REPORT GENERAL INFORMATION

Applicable Codes and Standards

The following current codes and standards represent the primary regulations that would apply to the District and are reflected in the subsequent listing of minimum code requirements. When the proposed projects are implemented, the most current codes and standards that are in effect at that time must be utilized.

Building:	Michigan Department of Energy, Labor and Economic Growth, 2009 Michigan Building Code Incorporating the 2009 Edition of the International Building Code (MBC)
	Michigan Department of Energy, Labor and Economic Growth, 2009 Michigan Rehabilitation Code for Existing Buildings Incorporating the 2009 Edition of the International Existing Building Code
	Michigan Department of Energy, Labor and Economic Growth, Bureau of Fire Services, Rules for Schools, Colleges and Universities, 1999, incorporating the 1997 Edition of the NFPA Life Safety Code (NFPA)
Barrier Free:	Michigan Department of Energy, Labor and Economic Growth, 2009 Michigan Building Code Incorporating the 2009 Edition of the International Building Code
	Americans with Disabilities Act (ADA), 2004, Accessibility Guidelines for Buildings and Facilities
Elevator:	Michigan Department of Energy, Labor and Economic Growth, Elevator Safety Division, Elevator Rules, Incorporating ASME A17.1 - 2010
Structural:	Michigan Department of Energy, Labor and Economic Growth, 2009 Michigan Building Code Incorporating the 2009 Edition of the International Building Code
Mechanical:	Michigan Department of Energy, Labor and Economic Growth, 2012 Michigan Mechanical Code Incorporating the 2012 Edition of the International Mechanical Code
	ANSI/ASHRAE/IESNA 90.1-2007 Energy Standard for Buildings Except Low-Rise Residential Buildings
Plumbing:	Michigan Department of Energy, Labor and Economic Growth, 2012 Michigan Plumbing Code Incorporating the 2012 Edition of the International Plumbing Code
Electrical:	Michigan Department of Energy, Labor and Economic Growth, 2011 Michigan Electrical Code Incorporating the 2011 Edition of the National Electrical Code.

ASSESSMENT REPORT GENERAL INFORMATION

Minimum Code Requirements

The following is a general summary of the life safety and barrier free code requirements for all buildings utilizing current applicable codes and standards. The summary is based on the requirements for new construction, only as a benchmark to evaluate existing conditions within each building.

Means of Egress and Fire Ratings:

- A minimum to two exits from all floors and a maximum common path of egress travel of 75 feet for non-sprinklered buildings and 100 feet for sprinklered buildings. (MBC Sections 1014 and 1021, NFPA 10-2.5)
- Doors shall swing in the direction of egress where serving an occupant load of 50 or more. Doors shall be equipped with panic hardware where serving an occupant load of 50 or more. (MBC Section 1008.1.10, NFPA 5-2.1.4.2)
- Dead end corridors cannot exceed 20 feet in length in non-sprinklered buildings and 50 feet in fully sprinklered buildings. (MBC Section 1018.4, NFPA 10-2.5.6)
- Maximum total exit access travel distance cannot exceed 150 feet in non-sprinklered buildings and 200 feet in fully sprinklered buildings. (MBC Section 1016, NFPA 10-2.6)
- The total width of a level means of egress shall not be less than the total occupant load served multiplied by a factor of 0.2" per occupant. (MBC Section 1005, NFPA 5-3.3.1)
- The total width of a means of egress stair shall not be less than the total occupant load served multiplied by a factor of 0.3" per occupant. (MBC Section 1005, NFPA 5-3.3.1)
- Rooms or spaces with an occupant load exceeding 50 or a travel distance exceeding 75 feet are required to have two exits or exit access doorways. (MBC Sections 1015 and 1021, NFPA 5-4)
- Rooms or spaces with an occupant load exceeding 500 require a minimum of three exits (MBC Section 1021, NFPA 5-4)
- Stairs and ramps shall have handrails on each side and shall be continuous without interruption. (MBC Section 1009.12, 1012, NFPA 5-2.2.4 and 5-2.5.4)
- Guards 42" high shall be provided at all open sided walking surfaces, stairs and ramps higher than 30" above the floor or grade below. (MBC Section 1013, NFPA 5-2.2.4 and 5-2.5.4)
- 1-hour fire rated corridor walls with 20-minute fire rated doors typically for non-sprinklered buildings. (MBC Section 1018.1, NFPA 6-2.32.3.1)
- 1-hour fire rated stair enclosures with 60 minute B label fire rated doors for stairs less than 4 stories high. (MBC Section 1022, NFPA 6-2.4)
- 1-hour fire rated elevator and utility shafts when less than 4 stories high. (MBC Section 708.4, NFPA 6-2.4)

Exit Corridors:

- Items permitted to be located in exit corridors, provided the required clear width of the corridor is not obstructed, include fixed benches of hardwood or non-combustible material, metal lockers, trophy cases which are not used for excessive amounts of combustible materials, drinking fountains, telephones, and other fixtures or items approved by this office (Michigan BFS Policy No. 5-23).

Exit Signage:

- Exits and exit access doors shall be marked with readily visible exit signs (MBC Section 1011, NFPA 5-10)
- Viewing distance in an exit access corridor shall not exceed 100 feet (MBC Section 1011, NFPA 5-10)

Emergency Egress Lighting:

- Lighting along all means of egress to provide not less an average of than 1 footcandle and a minimum of 0.1 footcandle measured along the path of egress at the floor level. Furthermore, a maximum-to-minimum illumination uniformity ration of 40 to 1 shall not be exceeded. (MBC Section 1006, NFPA 10-2.9)
- In the event of a power failure, an emergency electrical system shall automatically illuminate the following areas for a duration of net less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator: (MBC Section 1006, NFPA 26-2.9)

    - Exit access corridors
    - Exit stairways
    - Normally occupied spaces
    - Interior or windowless portions of buildings
    - Shop and laboratories
    - Flexible and open plan buildings

Occupancy Sensors:

- Michigan Energy Code 9.2.1.1 requires that all buildings over 5,000 square feet be equipped with automatic control devices capable of shutting off light in all spaces without occupant intervention.
- Section 9.5.1 requires that a lighting power budget be established based upon the building usage. The budget establishes a maximum allowable lighting wattage to be installed in the building.

Fire Alarm Systems:

- Manual fire alarm system is required for all educational occupancies (MBC Section 907, NFPA 10-3.4.1).

<u>Fire Suppression Systems</u>

- An automatic sprinkler system is required for all educational occupancies below the level of exit discharge, maintenance shops, woodworking areas, painting areas and kiln rooms (NFPA 10-3.2, 10-3.5).

ASSESSMENT REPORT GENERAL INFORMATION

Barrier Free Requirements

At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

At least 60 percent of all building public entrances shall be accessible.

When a building or portion thereof is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways, and a public way.

At least one accessible route shall be provided to stories above and below accessible levels with aggregate floor areas exceeding 3,000 square feet.

Changes in floor level between 1/4" minimum to 1/2" high maximum is to be beveled with a slope no steeper than 1:2. Any change in level greater than 1/2" must be ramped.

The minimum width of each door opening shall be sufficient for the occupant load thereof and provide a clear width of at least 32 inches.

Swinging doors must have maneuvering clearances in compliance with ICC/ANSI A117.1.

Door handles, pulls, latches, locks and other operating devices on doors required to be accessible must not require tight grasping, tight pinching or twisting of the wrist to operate.

Code compliant signage shall be provided at the following locations:

- Accessible areas of refuge required by MBC Section 1007.6
- Accessible entrances where not all are accessible
- Directional signage at inaccessible entrances
- Unisex toilets
- Accessible toilets where not all are accessible
- Directional signage to accessible toilets at inaccessible toilets

Wall mounted or free standing protruding objects must comply with MBC Sections 1003.3.1-1003.3.4.

Passenger elevators on an accessible route shall be accessible and comply with applicable provisions of the code.

Plumbing elements and facilities required to be accessible must comply with applicable provisions of the code. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing facility must be accessible.

ASSESSMENT REPORT GENERAL INFORMATION

Existing Building Code Application

The legal occupancy of any structure existing on the date of adoption of the code shall be permitted to continue without change unless deemed necessary by the building official for the general safety and welfare of the occupants and the public.

Existing buildings undergoing repair, alterations or additions and change of occupancy shall be permitted to comply with the Michigan Rehabilitation Code for Existing Buildings.

New work, including renovations and additions to any structure shall conform to the code requirements for new construction. Modifications and repairs shall not cause the existing structure to be in violation of the code. Portions not altered or affected by the modifications need not comply with the current building code.