HERC Building Upgrade Analysis Report

Prepared for:
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Homer, Alaska 99615

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Sign-off Sheet

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Dale Smythe, AIA

Reviewed by ______________________
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Bruce Hopper, PE, SE

Stantec

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Executive Summary

The Stantec Architecture Inc. design team and the Homer Public Safety Building Committee have been working together to determine the needs and potential solutions for the Police and Fire departments in the City of Homer. Funding limitations have led the team to explore options for combining, separating, or phasing the two requirements at the current Homer Educational and Recreation Center site. The goal of this report is to examine the potential reuse of portions of the building to provide space needed in a new Homer Police Station.

Discussions with the Authority Having Jurisdiction (Tim Fisher, State of Alaska Office of Fire and Life Safety) have confirmed the project falls within the requirements of Chapter 34 (Existing Structures) of the International Building Code. Without submission of a completed design for review, the discussion revolved around determining the probable level of upgrade required per their interpretation of the Code requirements given the Office's past history with this facility, and the expected new use. Considering the relationship to cost and impact to building systems the discussion focused mainly on what would be required as structural upgrades. The State does not have the capacity to review structural designs. Mr. Fisher confirmed that ensuring the capacity of the structural systems and any upgrades will be left to the designer of record. It was also confirmed that inclusion of any assembly occupancy (the gymnasium) with the reuse of other portions of the building would require fire separation (fire wall) or fire protection (sprinklers) for the entire facility.

Considering the age of the existing Homer Educational and Recreation Center's building systems and the plan for the new police station to be constructed as close as possible to the existing Homer Educational and Recreation Center the report assumes that electrical, data, communication, and heating utilities would come from the new police station facility and only be upgraded or replaced to the minimum functional need. It is assumed that all air systems serving the HERC will need to remain independent; especially considering the special requirements for a shooting range and the control of lead particles.

This report assumes that elements not required as code upgrades, but that could decrease the cost of operations, will be explored during the initial design effort. These elements include upgrades to the thermal envelope that could decrease heating costs, or hazardous material abatement that would reduce the requirement for licensed abatement contractors to be involved with future maintenance or upgrades through the life of the building. This report examines the reuse of only a limited area of the classroom wing. It is assumed the remainder of the building will remain as-is and demo cost is not included.

Rough order of magnitude pricing for the anticipated upgrades is being provided by the projects construction partner, Cornerstone. The pricing effort is based on an onsite walk-through with members of the design team; Ken Castner, Chairman of the Public Safety Building design committee; and Chief Robl; and the narrative descriptions of the upgrades contained in this report.

1.0 STRUCTURAL ASSESSMENT

1.1 BACKGROUND

1.1.1 As Built

The as-built drawings for the old Homer High School are dated 1956. The existing Homer Educational and Recreation Center (HERC) structure is still essentially the same as the 1956 drawings indicate. There are no additions to the structure, and it appears there are only some minor revisions in the floor plan layout since its original construction.

The structure is generally described as a wood framed building on concrete foundations. This description is apropos for the classroom portion of the old school. The roof deck consists of 2x tongue and groove decking over glue-laminated wood beams. The beams are in turn supported on 6x6 timber columns that are concealed in the walls. The columns bear on a concrete foundation system.

The gym portion of the old school has a roof deck consisting of 2x6 tongue and groove planking over steel joists. The joists span the width of the gym to bear on timber columns hidden within the walls. The timber columns bear on a continuous concrete wall footing.

The foundation system of the HERC building consists of a concrete slab on grade throughout the structure. The exterior walls bear on continuous concrete stem walls.

Lateral forces (wind and seismic loads) are resisted using plywood sheathing on nearly every wall in the building. The wall sections on the architectural drawings show the exterior of the building sheathed using 5/8-inch plywood. An inspection above the ceiling space reveals a layer of plywood on the inside face of the wall below the glue-laminated beam at the exterior walls.

The interior classroom partitions are sheathed with plywood as a finish material. Although these walls may not have been intended to be, they are defacto shear walls.

1.1.2 Building Codes

The structure is presumed to be designed in conformance with the 1952 Uniform Building Code. The structural loads used as the basis of design are listed in the General Notes on the structural drawings. Those loads are shown in the figure below:

DESIGN DATA:

Roof loads	
Live load	30 #/□'
T&G deck	10 #/□'
Ceiling	5 #/□'
Roofing	10 #/□'
total	55 #/□'

Misc. loads	
Wind load	30 #/□'
Floor live load	50 #/□'
Entrances	100 #/□'

Seismic loading - Zone 3 per Pacific Coast Uniform Bldg. Code. $F = \frac{0.15 \times 4.0}{4.5} \times D.L. = 0.133 \times D.L.$ T&G roof is assumed to act as a horizontal diaphram to carry loads to braced interior partitions and to end walls, to ground floor slab and foundations.

Assumed soil bearing capacity = 4000 #/□'

The model building code has changed dramatically since 1952, so comparing the loads listed in the General Notes in the as-built drawings to specified loads in our contemporary codes is not always a direct comparison. For example the "fastest-mile wind speed" was used to determine the wind loads on a structure. In the mid-1990s, the fastest-mile wind speed was abandoned in favor of using the 3-second gust speed. The basic wind speed used to calculate the design wind load was that speed associated with a 300-year return period. A load factor of 1.6 was applied to this load when designing building components. In 2010, the code changed again, now using the wind speed associated with a 700-year return period event. This new design wind speed is higher than that used in previous codes; and it is referred to as an 'ultimate' design wind speed. Recognizing the wind speed is greater, the design process now uses a load factor of 1.0 instead a load factor of 1.6.

The end result is that while the design process has changed significantly, the final design wind load is approximately the same. The as-built drawings list a design wind pressure of 30 pounds per square foot (psf), and the new code also requires a basic design wind pressure of 30 psf.

The code provisions used to determine seismic loads has changed significantly as well. The process used to calculate the design seismic load codes in current codes is long and labored, but the end result is new code only requires a seismic design load 2 percent greater than that used to design the structure in the 1950s.

1.1.3 Significant Historical Events

Beyond the information presented on the as-built structural drawings, the building survived the Magnitude 9.2, 1964 Great Alaska Earthquake; and, more recently, the Magnitude 7.1 Iniskin Bay Earthquake. Homer is located approximately 180 miles and 50 miles from those epicenters, respectively.

The HERC building has also survived several major wind events. The wind event in March 2003 recorded extremely high wind speeds in much of Alaska's south central region.

Other notable events include winters of significant snowfall. The south central region of Alaska has had several winters with significant snowfall including the record-breaking winter of 2011-2012.

1.2 GENERAL CONDITION

1.2.1 The Roof and Walls

The existing structure is in remarkable condition given its age. In general, the wood roof decking in all the areas where it could be observed appeared to be in good condition, and free of any water stains. No evidence of previous roof leaks was observed.

The glued-laminated wood beams are also in good condition. The beams appear to be manufactured using casein glue. Casein glue was commonly used to manufacture glue-laminated beams up until about the mid-1960. Its use was discontinued because it tends to break down when it is exposed to moisture. Nearly all the glue-laminated beams in the classroom area and the shop area were inspected during the site visit, and no indication was found that any glue joint is failing. All the beams inspected appear to be competent.

Performing structural calculations to verify the structure was designed appropriately is beyond the scope of this project. Assuming the beams were correctly designed, the roof should be capable of supporting a design roof snow load of 30 psf. The discussion in section 1.1.2 reveals that the design roof snow load under the current code is the same as that used in the original building design, so there is no compelling reason to augment or otherwise change the existing roof framing, except where the floor plan is to be changed.

1.2.2 The Concrete Foundation

The building's foundation system consists of cast-in-place concrete. The classroom wing is founded on a concrete slab on grade that is thickened under the load bearing walls. The exterior classroom walls are founded on cast-in-place foundation walls.

All the concrete elements that could be inspected appeared to be in very good condition. Usually, in buildings this old, the concrete is cracked from having settled, or it is spalled and degenerating where it is exposed to the weather. The concrete foundation under the HERC building is in very good condition. There are some cracks along the foundation walls, but none that require repairs.

1.2.3 The Lateral Force System

The lateral force (wind and earthquake) resisting system essentially consists of numerous shear walls throughout the structure. The building does not have adequate shear resistance on the exterior sides of the classrooms, where the perimeter walls are nearly all glass. The interior partitions are sheathed with either structural plywood, or plywood wall finish. As a result, the classrooms, although probably not designed to do so, are acting as a group of three-sided diaphragms. The copious use of wood sheathing as a wall finish likely helped this structure survive the 1964 Great Alaska Earthquake.

1.3 THE RE-PURPOSED BUILDING

1.3.1 The Shooting Range

Future plans for this building suggest the (plan) south half of the classroom addition being converted into a shooting range. To create that large, open space requires six timber columns to be removed along with the three walls between rooms 108, 109, 110, and 111. Removing the columns will require new beams to support the existing roof structure. The new beams will be framed from the exterior wall to the corridor wall under the existing roof beams. Two new columns will be required at each beam location, one under each end.

As noted previously in this report, the partitions between the classrooms probably function as de facto shear walls. Removing these interior walls significantly reduces the lateral resistance of the building to both wind loads and seismic loads. A detailed structural analysis of the building will likely prove that the existing roof diaphragm over the south half of the classroom addition will not be adequate to resist the design lateral loads. The existing diaphragm can be augmented by adding structural wood sheathing panels to the underside of the existing tongue and groove deck between the existing glued-laminate roof beams. This new sheathing could then be connected to new, competent wood-sheathed shear walls at each end of the range. The new wood shear walls would in turn be bolted to the existing concrete foundation system.

The windows in the (plan) south wall will have to be removed to control the lighting in the shooting range. The empty holes should be infilled with wood framing sheathed with wood structural wood shear panels, which will create a competent shear wall on the exterior side.

1.3.2 The Evidence Room

Future plans suggest the north half of the classroom wing will be remodeled to create an evidence storage room. As with the shooting range, if the interior partition walls between the classrooms are removed, the underside of the existing roof deck should be sheathed and new shear walls constructed on each end of the space. If the walls are not removed, they should at least be augmented to ensure they function as competent shear walls.

The windows should be removed from the north wall of the classroom wing and replaced with infill and structural wood sheathing to create a more secure storage area. Walls around secure storage areas are often hardened by adding chain link, sheet metal or other products to prevent intruders from entering by cutting through the walls. Adding shear strength to the walls can be accomplished in conjunction with these other improvements.

1.4 THE TWO-STORY POLICE STATION ADDITION

Future plans for this site include the addition of a two-story police station on the south side of the existing HERC building. This new addition should be framed to be structurally independent of the existing structure. The new police station will be designed as an 'essential' facility under the new code, meaning it will be designed to a standard much higher than the existing HERC building. The existing structure will be much more likely to be damaged in a future extreme weather or seismic event than the new structure.

Creating a separation between the two structures will prevent the existing building from placing undue burden on the new structure during that event. Structurally separating the two buildings means placing a joint that is only inches wide between the two structures. Ostensibly, the two structures will function as a single building.

The new two-story police station will be higher than the existing building. As a result, the new building could cause snow to drift on the existing lower roof. There is little means available to prevent the drifting, so the existing roof will have to be strengthened where the new snow drifts are expected to form. The existing roof structure can be shored up by adding new beams under the existing beams, spanning from exterior wall to the corridor, as-is required for the shooting range. An alternative is to create a new roof over the existing roof to bear the weight of the potential snow drifts.

1.5 SUMMARY

From a structural viewpoint, re-purposing the HERC building to create a shooting range, evidence storage, and possibly a shop area is feasible; however, there are some minor structural alterations required to make the space useable. The alterations should include adding some shear resistance (1/2-inch plywood with fasteners 6 inches O.C.), and improvements to the gravity load system where loads imposed as a result of the new construction will be greater than the loads for which the existing system was designed.

2.0 ARCHITECTURAL ASSESSMENT

2.1 CODE UPGRADES

The repair and alteration of an existing building within the City of Homer is governed by Chapter 34 (Existing Structures) of the International Building Code (IBC) per the State of Alaska Office of Fire and Life Safety. Without the submission of a completed design for review by the State's Office, the discussion with Tim Fisher (Building Plans Examiner) revolved around determining the probable level of upgrade required per their interpretation of the IBC requirements, the Office's past history with this facility, and the expected new use.

2.1.1 Fire Protection- Sprinklers

The expected total square footage of the two-story Police Station would be larger than current code would allow for an unprotected structure; therefore, it is assumed that a new facility or reused portions of the HERC will be sprinklered. It was also confirmed with Mr. Fisher that an inclusion of any assembly occupancy (the gymnasium) with the reuse of other portions of the building would require fire separation (fire wall) or fire protection (sprinklers) for the entire facility.

2.1.2 Americans with Disability Act (ADA)

The existing structure is two levels with exits at grade. It is assumed only minor site modifications from slope and surface would be needed to allow exiting to a safe area to meet the requirements of ADA. Door threshold and hardware are assumed to be replaced and would meet all current requirements. It is assumed that all required ADA restroom facilities will be provided in the newly constructed portions.

2.1.3 Exiting

Considering the planned reuse of the classroom wing for lower occupant type loading (storage, maintenance, and shooting range) the existing number of exterior exits and arrangement, and the planned new construction appears able to meet current code. Meeting the requirement for two means of egress at the west end; occupants would need to exit north at-grade or through a new addition to the south. If the gymnasium is reused as part of the project, the exiting of the two areas will need to be separated but appears to be feasible within the existing arrangement.

2.2 EXTERIOR ENVELOPE

2.2.1 Roof

The seismic upgrades for the roof diaphragm can be constructed from inside the facility and will not require demolition of the existing roof. The price of a new roof is not included but the existing condition has not been verified.

For purposes of this report we are assuming the insulation values will remain as-is and that within the concept design an analysis would be done to determine the cost benefit of increasing the roof insulation and associated energy savings. The two factors that will reduce the benefit of additional insulation will be the many air exchanges required for the shooting range, and the potential for relatively low temperature requirements for evidence storage.

2.2.2 Exterior Wall Assembly

This report assumes no thermal upgrade to exterior walls for similar reasons to the roof. The project will require infill of windows for lateral resistance as described by the structural review. Because of the infill, new paint and prep is assumed for all exterior walls.

2.2.3 Exterior Window and Doors

All doors and windows in the facility that are to remain have reached the end of their service life and should to be replaced. Replacement will ensure the correct waterproofing and air tightness. New hardware required to meet ADA, and current code requirements for safety glazing will be satisfied with unit replacement. Insulated glazing in exterior windows and doors will also reduce energy use.

2.3 INTERIOR FINISHES

Most interior finishes in the facility have reached the end of their useful service life. Considering the cost limitations, all interior finishes would be demolished for new construction and only replaced as allowed by budget or as a requirement for fire protection.

2.3.1 Floors

As a cost saving measure all existing flooring will remain. Asbestos mastic in the floor will remain contained.

2.3.2 Interior Walls

Interior walls will be patched to accommodate new devices and infills and all interior surfaces will be repainted.

2.3.3 Ceilings

Considering the structural diaphragm, sheathing upgrades all ceilings will require demolition. It is assumed all lighting will be suspended and that no new ceiling would be installed. Underside of sheathing will be painted.

2.3.4 Interior Doors

It is assumed that because of security requirements and new layouts for a public entrance to the shooting range, and separation from the remainder of the building, all interior doors and hardware will be new.

2.4 HAZARDOUS MATERIALS

2.4.1 Existing Material to Remain

Friable and non-friable asbestos containing material (ACM) is present at the HERC building. Friable asbestos is classified as regulated asbestos containing materials (RACM) by the U.S. Environmental Protection Agency (EPA). RACM includes thermal system insulation and surfacing materials, which have been applied through methods such as spraying or troweling. RACM creates the greatest risk of exposure due to its propensity to release asbestos fibers into the air when disturbed. Examples of RACM at the HERC building are the insulation that covers the old boiler and pipe insulation located on heating and domestic plumbing located in various areas the building.

Non-friable ACM is broken down into two separate classifications: which are Category I non-friable asbestos and Category II non-friable asbestos and the HERC building contains both. Category I non-friable ACM is defined as resilient floor coverings, mastics, asphalt roofing, packings, and gaskets. Category II non-friable ACM is defined as any material excluding Category I non-friable ACM that when dry cannot be crumbled, pulverized, or reduced to powder by hand pressure. These materials do not present the high level of fiber release that RACM does; however, if not handled correctly the material can still present a health hazard. Examples of non-friable asbestos at the HERC building include joint compound within gypsum assemblies, vinyl flooring, and various types of mastics.

Any ACM that would be directly disturbed during a renovation of the HERC building would need to be removed prior to the disturbance taking place. Examples of this include gypsum walls, soffits, and ceilings that may be affected as part of a reconfiguration of the interior layout. Another example would be the speaker/clock units in the classrooms, which contain a black coating within its housing that is ACM. Another example would be the black mastic that adheres chalk boards to walls. In some locations the boards have been removed, leaving the asbestos mastic exposed.

Any ACM that is to remain in place should be properly managed in order to comply with Occupational Safety and Health Administration (OSHA) and EPA requirements. The elements of this management effort would include:

- Designate an asbestos coordinator.
- Comply with OSHA Hazard Communication requirements.
- Placard all friable ACM.
- Provide asbestos awareness training for all staff who work within building.
- Conduct periodic inspections of ACM to track condition.
- Develop, implement and administer contractor procedures for working in the building.

2.4.2 Mold and Mildew

No reports or testing for confirmation of mold or mildew was completed.

3.0 MECHANICAL ASSESSMENT

The purpose of this portion of this report is not to assess the condition and age of the mechanical systems in the existing building, but to identify code required upgrades that would be needed if a portion of the building was to be re-purposed. The area of work would include the upper floor of the existing building, which would be converted from classrooms and office space into a shooting range, evidence storage and drying, and a maintenance space. The lower floor of the building houses the multi-purpose room, locker rooms, a fitness room, a kitchen, storage, and the boiler room. These spaces would remain as-is.

This renovation would occur at the same time as the construction of the new Police Station building, adjacent to the HERC building. The new and existing building would be separate structures with a connection, allowing central mechanical systems in the new building to serve the re-purposed areas, in lieu of doing major upgrades to the existing systems.

3.1 PLUMBING

The existing building is served by the public water and sewer utility. A 2-1/2-inch domestic cold water pipe enters on the east side (plan south) of the building, routes directly to the boiler room, and goes through a water meter and pressure reducing valve. A hot water storage tank, located in the boiler room and heated by the hydronic heating system, provides domestic hot water for the building. Most of the domestic water system appears to be from original construction.

The shooting range and evidence storage/drying spaces should not require the addition of any plumbing fixtures. If desired, a utility sink could be added to the maintenance room and be fed off the existing building's plumbing system without requiring any code upgrades to the main service. Backflow protection could be provided at the utility sink, as required.

3.2 FIRE PROTECTION

The HERC building is currently not equipped with a fire sprinkler system. The shooting range and evidence storage/drying spaces will need to be sprinklered; however, the existing 2-1/2-inch water service is too small to serve a sprinkler system and it would be cost prohibitive to upsize the water service to the existing building and provide the required backflow prevention. Therefore, it is our recommendation that the remodeled portions of the existing building be fed off the wet-pipe fire sprinkler system that will be installed in the new building.

A separate dry-pipe sprinkler system or chemical suppression system could be considered for use in evidence storage, but would likely add significant cost to the project.

3.3 FUEL SYSTEM

An above ground fuel tank serves the facility. The tank is not adequately secured to resist damage from earthquakes, as required by National Fire Protection Association (NFPA). The tank base should be upgraded and the tank seismically anchored to the base to prevent overturn.

Although the new equipment discussed under heating and ventilation will be gas-fired, the existing fuel-fired boiler could remain in use to temporarily heat the portions of the existing building not being re-purposed under this project, to include the multi-purpose room, Locker Rooms and Kitchen.

3.4 HEATING

The building is currently heated with a fuel-fired boiler that replaced the original steam-fired boiler, which was abandoned in place. Individual rooms are heated by cabinet unit ventilators (CUVs) with heating coils or hydronic baseboard. The fuel-fired boiler is in good operating condition and could remain in use to heat the portions of the building that do not get re-purposed under the scope of this project.

The existing CUVs and baseboard in the re-purposed portions of the existing building would be demolished. Since the CUVs have a ducted opening through the exterior wall, patching of the existing wall would be required. New terminal heating equipment would be provided to accommodate the new use and layout; most likely a combination of baseboard and unit heaters. Hydronic hot water to these terminal units would be fed from the central heating system in the new building.

No major code upgrades would be required to the existing central heating system.

3.5 VENTILATION

Ventilation for the building is provided by a variety of systems. The classrooms and some of the office spaces are ventilated by the CUVs, which bring in outside air and heat it as required. A central, ducted relief fan pulls the air from each of these spaces and discharges it to the outside. This ventilation scheme will not work for the re-purposed spaces, so the CUVs, the relief fan, and associated relief ductwork would be demolished.

Although it does not appear that the relief fan is serving any of the spaces that are to remain as-is, this would need to be confirmed. In this case, a new relief/exhaust fan would replace the existing relief fan to provide the correct airflow and control. This fan would also be sized to support relief/exhaust from the evidence storage and maintenance spaces.

A small, 900 cubic feet per minute (CFM) air handling unit was installed in 1997 to serve an area that was converted into office space on the west side of the second floor. It is located above the ceiling of the area it serves. Consideration could be given to re-using this unit for the evidence storage area, but it would need to be confirmed that it was large enough to provide code-required ventilation and whether the filtration was adequate. Regardless of whether the unit could be salvaged or not, the supply and return/relief ductwork would need to be completely replaced. As another option, ventilation could be supplied to evidence storage from the central system in the new building.

The multi-purpose room has its own dedicated air handling unit, located in a fan room on the upper floor. This system would remain mostly as-is, with minor modifications to the ductwork to accommodate any renovation to the wall that divides the multi-purpose room from the rest of the building. Exhaust and make-up air systems for the kitchen and locker rooms located on the lower floor, and the restrooms located on the upper floor, could remain as-is unless floor plan changes necessitate relocating ductwork or exhaust fans.

A dedicated, once-through exhaust/make-up air ventilation system will be required to serve the shooting range. The preferred system would include a roof-mounted exhaust fan and a gas-fired make-up air unit, if the structural analysis or renovations permit it. As an alternative, the exhaust fan could be mounted to an exterior wall and the upper level fan room could be enlarged to make room for a make-up air unit equipped with a hydronic heating coil (in lieu of gas-fired).

3.6 COOLING

There is currently no mechanical cooling in the existing building. Mechanical cooling does not need to be added to comply with code, but could be added for comfort if desired.

4.0 ELECTRICAL ASSESSMENT

This assessment is to identify code required upgrades to the facility. It also provides recommended improvements to the existing system.

4.1 ELECTRICAL DISTRIBUTION

The existing electrical distribution system is adequate. The main distribution panel is a very old 800a, 120/208-v, 3-phase, 4-wire, Westinghouse switchboard that will be hard to find replacement parts for, if at all. Panel A and Panel 1A are also older type Westinghouse panelboards. The rest of the panels are Square D panelboards for which breakers are still readily available.

There are a few code required deficiencies that need attention.

- Conduit that is not supported properly.
- Ensure all wiring is routed in conduit or MC cable to devices. It was noted at a corridor light fixture that the conductors were extended to the fixture from the junction box.
- Damaged conduit runs that that have separated joints need to be corrected. A resistance test should be performed on each conduit run to identify and correct any separations since the conduit is used as the equipment grounding electrode.
- Damaged surface raceways must be corrected and devices properly installed.
- Junction boxes that need to have their covers and/or knockouts installed.
- Ensure proper working clearances are maintained in front of all panels.

4.2 LIGHTING SYSTEMS

A majority of the lighting is provided by fluorescent T12 fixtures, incandescent bathroom wall sconces, and exterior high-intensity discharge (HID) light fixtures. Many of the fixtures are in poor condition. It is recommended that they be replaced with energy efficient light-emitting diode (LED) fixtures, which may be more cost effective than replacing the existing ballasts, lamps, and lenses.

The code requires emergency egress lighting at each exit door to sufficiently light the exit landing. These will be required to be installed.

4.3 WIRING DEVICES

The wiring devices are at the end of their useful life. Some devices in the surface raceways are falling out and have exposed conductors. This must be corrected. Ground fault circuit interrupter (GFCI) type receptacles must be installed in all restrooms and within 6 feet of a water source. Exterior receptacles must be weather resistant GFCI type with while-in-use covers.

4.4 SPECIAL SYSTEMS

4.4.1 Fire Alarm System

The building has simple single zone Edwards E 1257 fire alarm panel. The system has some audible/visual indicating devices and pull stations. If this system is to remain, devices need to be added and the battery backup capacity rechecked. Devices that need to be added include audible/visual indicating devices in restrooms and other occupied spaces, as well as heat and carbon monoxide (CO) detectors in the boiler room and smoke detectors in the electrical room. Since the HERC building does not have a sprinkler system, smoke detectors should be added along the means of egress from the facility.

It is recommended that the system be replaced with an addressable system and devices added to provide effective coverage of the facility.

4.4.2 Telecommunications

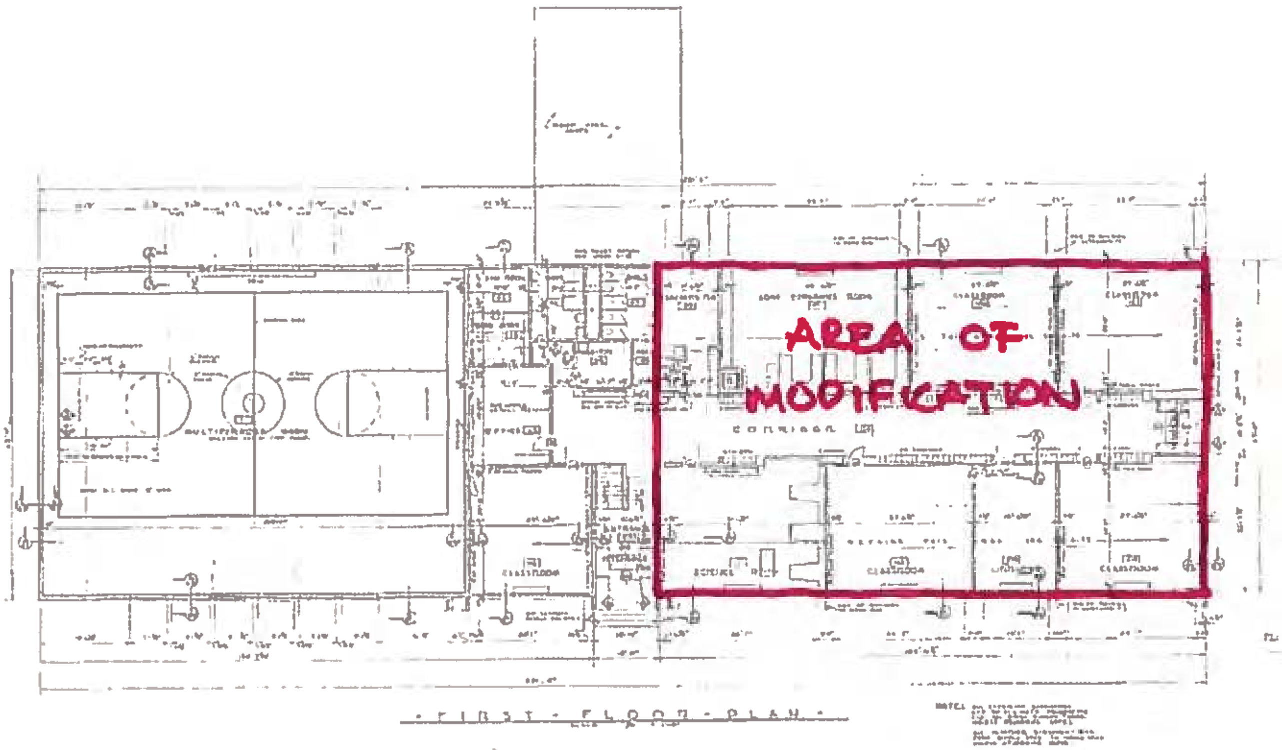
The installation and workmanship of the existing telecommunication system is very poor. Even the routing of the incoming cables to the telephone backboard and punchdown blocks should be redone. The system has been scattered throughout the facility and abandoned portions and cables left hanging in place. The entire system should be removed and new cabling routed to the necessary locations.

4.4.3 Clock/Speaker System

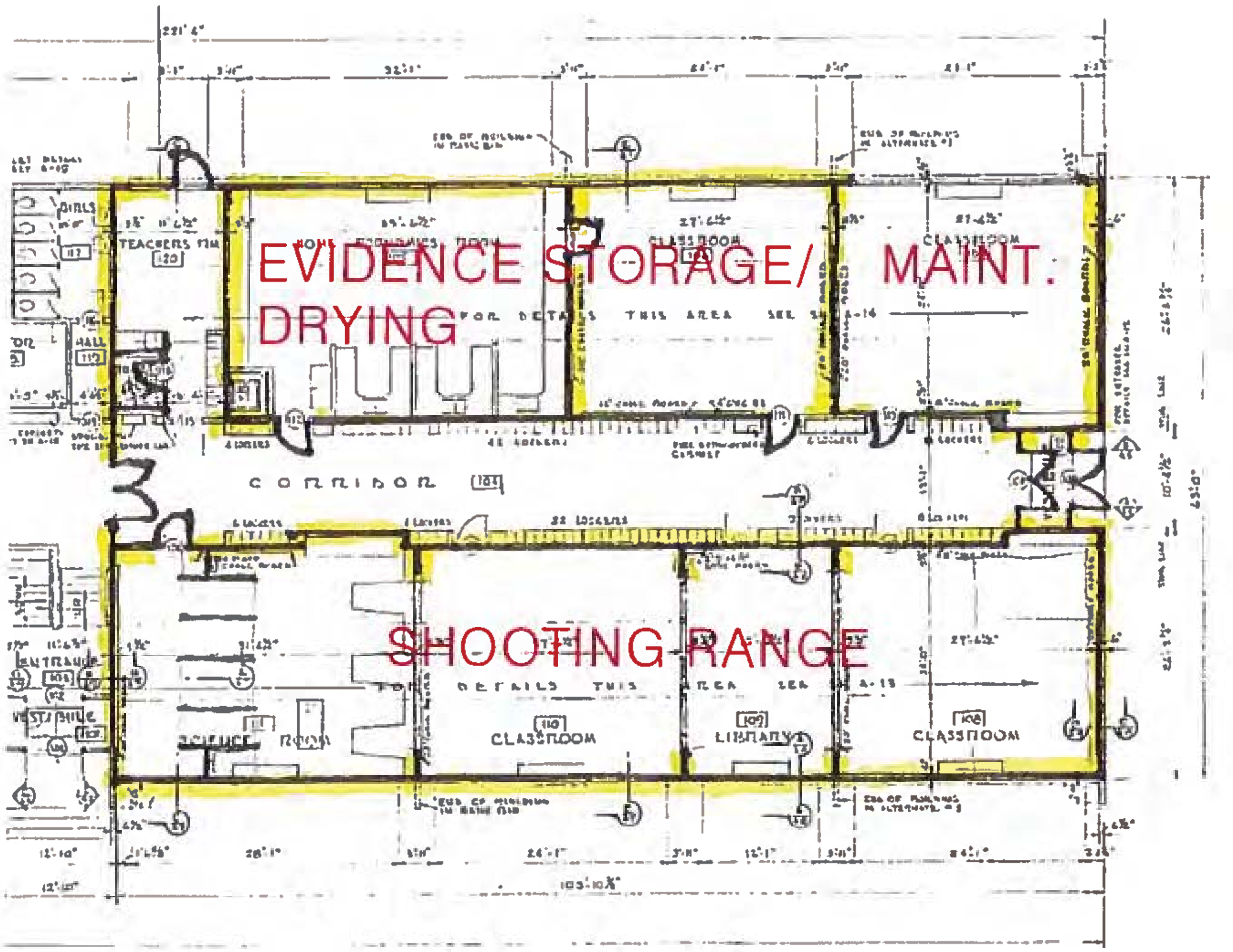
Parts of this system have been removed and since it is not needed, it should be removed.

Appendix A AREA OF MODIFICATION

A.1 PORTION OF HERC TO BE RE-USED



A.2 CONCEPT LAYOUT OF RE-PURPOSED AREAS



HERC Building Analysis
Order of Magnitude Cost Estimate

April 24, 2013

Building Areas

Gym Area	5,700	SF
Lower Level Area	2,800	SF
Upper Level Area	8,300	SF
Total Building Area	16,800	SF

Description	Quantity	Units	Unit Cost	Totals	Total Required for Code and ADA Compliance	Total Recommended for Building Performance
Sitework						
Walkway	625	SF	$9.48	$5,926	$5,926	$0
HCP Paving	1,000	SF	$4.48	$4,481	$4,481	$0
Stoop	28	SF	$10.00	$280	$280	$0
Regrading	3,750	SF	$0.50	$1,875	$1,875	$0
Sitework Subtotal				$12,562	$12,562	$0
Replace Siding & Insulation	11,880	SF	$52.80	$627,264	$0	$627,264
Windows	683	SF	$92.00	$62,873	$0	$62,873
Renovations: Gym	5,700	SF	$82.07	$467,775	$93,555	$374,220
Renovations: Lower Level	2,800	SF	$120.00	$336,000	$67,200	$268,800
Renovations: Upper Level	8,300	SF	$120.00	$996,000	$199,200	$796,800
Replace Roofing Assembly, Complete	15,200	SF	$28.00	$425,600	$0	$425,600
Architectural Subtotal				$2,915,512	$359,955	$2,555,557
Structural						
Upgrade Roof Structure	15,200	SF	$20.00	$304,000	$0	$304,000
Upgrade Shear Walls: Upper Level	480	LF	$126.72	$60,826	$0	$60,826
Upgrade Shear Walls: Lower Level	230	LF	$126.72	$29,146	$0	$29,146
Structural Subtotal				$393,971	$0	$393,971

Description	Quantity	Units	Unit Cost	Totals	Total Required for Code and ADA Compliance	Total Recommended for Building Performance
Mechanical						
New Sprinkler System	16,800	SF	$4.50	$75,600	$75,600	$0
New Heating Distribution System	16,800	SF	$27.00	$453,600	$0	$453,600
New Air Handlers & VAV Air Distribution System	16,800	SF	$30.00	$504,000	$0	$504,000
New Bathrooms: Lower Level	2	EA	$91,200.00	$182,400	$182,400	$0
Add Roof Overflow Drain System With Heat Trace	15,200	SF	$4.00	$60,800	$60,800	$0
Mechanical Subtotal				$1,276,400	$318,800	$957,600
Electrical						
Replace Power Distribution System	16,800	SF	$14.00	$235,200	$47,040	$188,160
Replace All Lighting	16,800	SF	$20.95	$351,900	$70,380	$281,520
New Fire Alarm System	16,800	SF	$3.50	$58,800	$58,800	$0
New Telecom Distribution System	16,800	SF	$6.45	$108,300	$0	$108,300
Electrical Subtotal				$754,200	$176,220	$577,980
Subtotal				$5,352,645	$867,537	$4,485,108
General Contractor Costs						
General Conditions	15%			$802,897	$130,131	$672,766
Hazmat Abatement (allowance)	1	LS		$336,000	$336,000	$0
Contractor Overhead & Profit	8%			$519,323	$106,693	$412,630
Estimating Contingency	10%			$701,087	$144,036	$557,050
Total Estimated Construction Cost (2013 Dollars)				$7,711,952	$1,584,398	$6,127,555
Total Construction Cost Per Square Foot (2013 Dollars)				$459	$94	$365
Project Costs						
Permits and Fees	2%	of Const Cost		$154,239	$31,688	$122,551
Design	10%	of Const Cost		$771,195	$158,440	$612,755
Construction Admin & Management	6%	of Const Cost		$462,717	$95,064	$367,653
Furniture, Fixtures, Equipment	5%	of Const Cost		$385,598	$79,220	$306,378
1% For Art	1%	of Const Cost		$77,120	$15,844	$61,276
Project Contingency	10%	of Const Cost		$771,195	$158,440	$612,755
Total Estimated Project Cost (2013 Dollars)				$10,334,475	$2,123,187	$8,211,288
Total Project Cost Per Square Foot (2013 Dollars)	16,800	SF		$615	$126	$489