



701 East Tudor Road, Suite 250  
Anchorage, AK 99503 | 907.257.9100

2215 Midway Ln, Suite 200  
Bellingham, WA 98226 | 360.255.7235

Proj. Code: WMCEVAL  
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Engineer: DLB  
Checked: D. Boggs  
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## Wrangell Medical Center Mechanical Deficiency List

Refer to Estimations Inc. 1 May 2018, Wrangell Medical Center Building Condition Survey construction cost estimate for item costs.

ITEM	TITLE	DESCRIPTION OF DEFICIENCY	PROPOSED CORRECTION	CODE / CRITERIA	NOTES
M01	Boiler Room Fuel Oil System	1988 installed 3,000 gallon UST single wall FO tank with separate FOS/FOR lines to both boilers & one water heater in mechanical room routed UG and through crawl space.	Remove UST and FOS/FOR lines. Provide 3,000 gallon double wall UL AST with double wall FOS/FOR lines to 60 gallon day tank with containment and FOR pump.	IFC, ADEC	Rehabilitation; meet current standards & reduce risk
M02	Water Service	8" building water service to fire water and domestic water line is not protected by back flow device. Sprinkler riser room without floor drain.	Provide 8" reduced pressure backflow device and 6" waste floor drain system to accommodate stuck valve.	2012 UPC 603.3	
M03	Domestic Water Cross Connections	Sprinkler system is connected to domestic water without backflow device. Multiple service sinks and hose connections throughout building with cross connections.	Provide 6" double check backflow device at sprinkler system and backflow protection devices at cross connection points.	2012 UPC 603.3	
M04	Sprinkler System Leaks	Sprinkler system with three dry pipe risers distribution piping with leaks at threaded fittings on XL pipe, which has a corrosion resistance ratio less than one.	Replace sprinkler system piping 2" and under with galvanized pipe with a corrosion resistance ration 1 or greater.	2013 NFPA	Repair, rehabilitation
M05	Sprinkler Heads	All sprinkler heads are dry type and require replacement or representative samples every 10 years.	Phase replace sprinkler heads when replacing sprinkler piping and include flex pipe for sprinkler heads to meet seismic requirements for suspended ceilings.	2011 NFPA 25 5.3.1.1.1.6	

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M06	Wastewater, Sewer, Lines	6" wastewater service line has failed in areas, requires multiple cleaning each year due to root blockages, and interior 4" wastewater line has & reversed slopes & corrosion holes.	Replace 6" wastewater service line and 240' of interior 4" wastewater.	2012 UPC Ch. 7	Repair, rehabilitation
M07	Domestic Water Heater	Single aged oil fired water heater placed on CMUs without anchors or seismic restraints. Multiple hot water accumulators without restraints and code required distribution mixing valve.	Replace with duplex hot water generator or source for redundancy and increased efficiency; including seismic restraints and mixing valve.	2012 UPC Chapters 4 & 5	
M08	Seismic Anchors and Restraints	Mechanical, electric, & plumbing (MEP) components, equipment and systems are not seismically restraint. Original construction criteria doesn't meet current requirements, including life safety and hazardous elements.	Update MEP elements throughout the facility to meet seismic component importance factor, $I_p=1.5$ for this essential healthcare facility.	2012 IBC, 2010 ASCE 7	
M09	Boiler Room Combustion & Ventilation Air	Boiler room combustion air doesn't meet code requirements and ventilation air is not adequate.	Add boiler room mechanical combustion air and ventilation cooling air system.	2012 IMC	
M10	Building Automation System	Building uses pneumatic controls and does not have a functional building automation system to allow for monitoring or control of MEP systems, interfacing with building security or allowing remote interface. Energy efficiency, preventative & predictive maintenance, efficient response to alarms and user requirements are impacted.	Provide building automation system, BAS.	Recommend to monitor, control, & record values to meet 2014 FGI criteria	
M11	Medical Vacuum System	Medical vacuum (MV) Category 1 system does not meet NFPA 99 source or distribution requirements, including isolation & alarm requirements; system is lacking medical gas verification records.	Provide medical vacuum (MV) source equipment in dedicated room with connections to master alarm panels and local alarms. Revise MV distribution system, zone valves, and outlets to meet NFPA 99 requirements.	2012 NFPA 99, 2012 UPC	

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M12	Medical Oxygen Source	Oxygen concentrator and connected 80 psig low flow tank are not located in accordance with IFC, NFPA 55 and NFPA 99 requirements. O2 cylinder fill operations includes 2,000 psig and 55 psig flexible lines (exposed & concealed) routed through building storage and occupied areas.	Provide separate heated, ventilated, and sprinklered building (20'x30') meeting IFC requirements. Provide secure and protected cylinder fill points.	2012 IFC, 2012 NFPA 99	
M13	Medical Oxygen Cylinder Storage	Greater than 12 Type K O2 cylinders are storage adjacent & under building overhang. Empty cylinders are separated and stored outside exposed to environment.	Provide protected exterior shelter for separated full and empty cylinders.	2012 IFC, 2012 UPC, 2012 NFPA 99	
M14	Medical Oxygen Manifold	Oxygen manifold with 4 cylinders on each primary and secondary headers. Manifold control for alarms & switching has been modified for direct connect to oxygen concentrator 55 psig discharge from a single regulator from the 150 gallon 80 psig vessel and alternate 2,000 psig oxygen system piped to filled cylinders while connected to manifold. Manifold room is not located, ventilated, or fire rated per IFC.	Provide separate oxygen manifold room per IFC criteria without direct connections to oxygen concentrator and with manifold controller with PSV vented to exterior. Provide connections to master alarm panels and local alarms.	2012 IFC, 2012 UPC, 2012 NFPA 99	
M15	Medical Oxygen & Medical Vacuum Distribution Systems & Alarms	The Medical Oxygen (O2) and Medical Vacuum (MV) Category 1 piping systems, zone valves, master & area alarm panels do not meet requirements. The number of outlets per rooms do not meet UPC or FGI requirements. Records showing annual medical gas inspections or last medical gas verifier inspection are not available.	Revise O2 & MV distribution systems to incorporate zone, source, & service valves; area and dual master alarm panels, and inlet/outlets to meet program requirements and installations per criteria.	2012 IFC, 2012 UPC, 2012 NFPA 99, 2014 FGI	

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M16	Combustible Plenum Ventilation	Above ceiling and attic areas are used for plenum return air and exhaust air. Plenums contain combustible materials and access to different occupied areas without fire rated assemblies.	Provide return air and exhaust air ducted systems or rated plenum assemblies through office and healthcare areas.	2012 IFC, 2012 IBC, 2012 IMC	
M17	Life Safety Plans	Life safety plans are not available and rated assemblies with occupancy separations are not identified.	Provide life safety plan review including required assembly separations and exit plans.	2012 IFC, 2012 IBC, 2012 IMC, 2012 NFPA 101	
M18	HVAC and Ventilation Systems	Building's two air handling units do not provide adequate outside air, total air change, temperature (heating & cooling) control, humidity control to meet IBC, IFC, IMC, NFPA 101, FGI criteria; similarly exhaust air and differential air pressure relationships are not provided. Many occupied areas are not provided with ventilation.	Demo existing AHUs and exhaust air fans, ductwork and GRDs. Provide complete building HVAC ventilation (heating, cooling, humidity, filtration, & control) systems; estimated supply air 33,000 CFM. Support equipment include additional boilers, chillers (60 tons), pumps, ductwork, FD, FSDs, VAV terminal units, air inlet/outlets, and controls.	2012 IFC, 2012 IBC, 2012 IMC, 2012 NFPA 101, 2014 FGI	
M19	Hot Water, Plumbing	Hot water plumbing system is not temperature regulated to meet UPC or FGI requirements, including hot water circulation criteria.	Provide hot water temperature control devices for fixtures and circulation to meet FGI and UPC criteria.	2012 UPC, 2014 FGI	
M20	Asbestos Containing Materials, ACM	Insulation containing asbestos is believed to be distributed throughout the mechanical systems in addition to ACM in other materials.	Conduct ACM survey and demo mechanical insulation and replace with insulation meeting energy saving criteria.	OSHA	this tasks would be included with building with ACM survey, report, & abatement plan.