



EARTH SYSTEM RESEARCH LABORATORY GLOBAL MONITORING DIVISION

New Barrow Atmospheric Baseline Observatory

B. Vasel¹ (brian.vasel@noaa.gov), C. Schultz¹, B. Thomas², S. Ingalls³, A. Clarke^{4,1}, C. Hepp⁵, B. Blau⁵, R. Edwards⁵, S. Bratton⁵, D. Holst⁶, E. Larkin⁶, E. Locklear⁶

¹ NOAA Earth System Research Laboratory, Global Monitoring Division (GMD), Boulder, CO • ² NOAA Earth System Research Laboratory, Global Monitoring Division, Barrow Observatory, Utqiagvik, AK • ³ NOAA Office of the Chief Administrative Officer (OCAO) Project Planning and Management Division (PPMD), Seattle, WA • ⁴ Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO • ⁵ NOAA Acquisition and Grants Office (AGO), Western Acquisition Division (WAD), Boulder, CO • ⁶ NOAA Office of Oceanic and Atmospheric Research (OAR) Office of the Chief Financial Officer/Chief Administrative Officer (CFO/CAO)

The Barrow Atmospheric Baseline Observatory (BRW) is located in the Arctic, on the northernmost point of the United States, approximately 8 km northeast of the village of Utqiagvik (formerly Barrow).

NOAA's long-term BRW facility is undergoing a major upgrade (2019 – 2020) that will significantly increase the site's scientific capabilities and opportunity for collaboration:

- New state-of-the-art observatory
- Garage expansion
- New 30-meter instrument tower
- Campaign science deck
- Flexible laboratory space
- Roof science deck
- Dedicated server room for NESDIS and OAR
- Potential fiber connection to facility



Pre-construction
28 April 2019



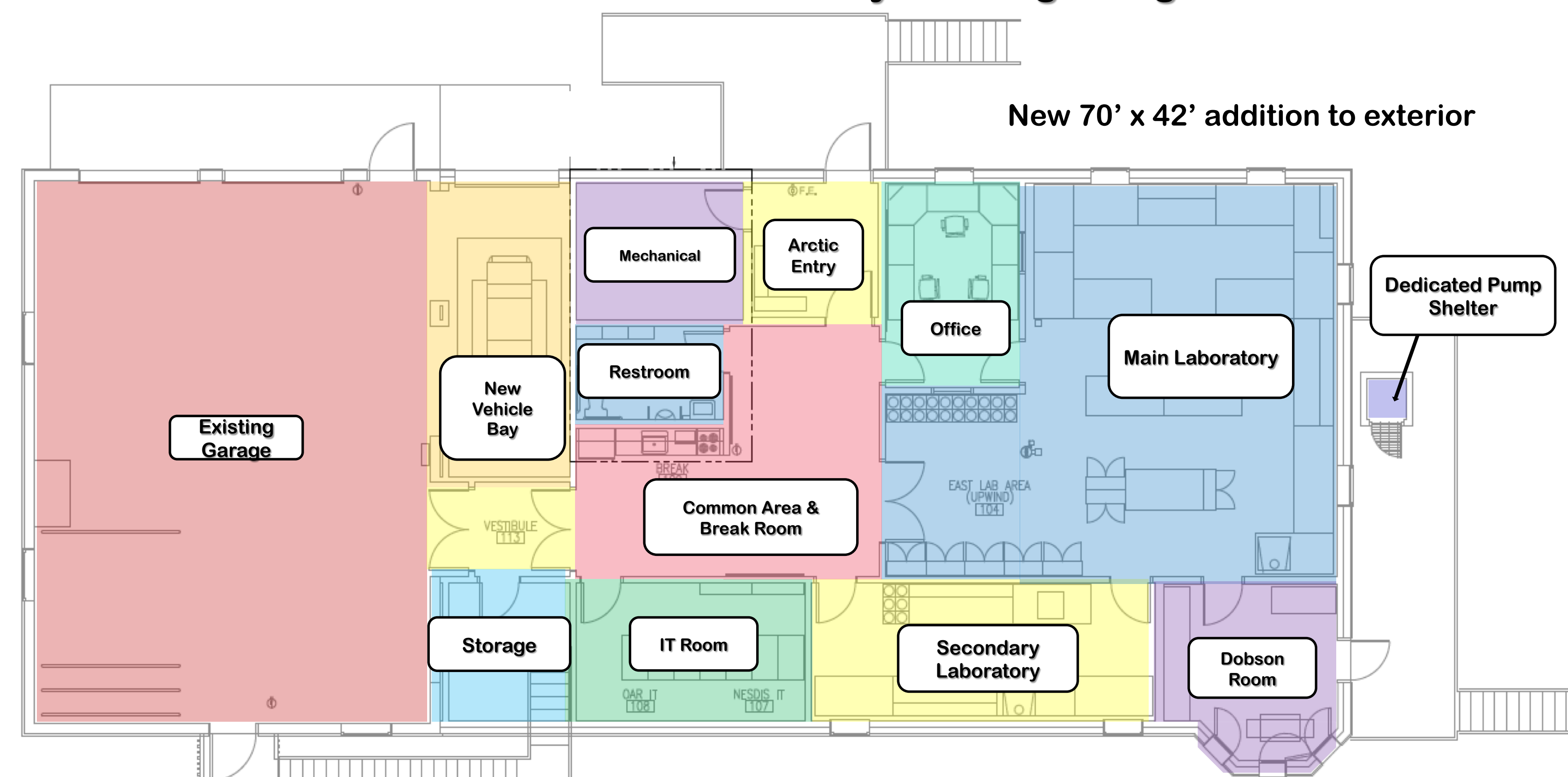
Piling foundation installation
29 April 2019



Piling foundation completed
13 May 2019

Construction webcam link: www.esrl.noaa.gov/gmd/obop/brw/construction_cam.html

New Barrow Observatory Building Design

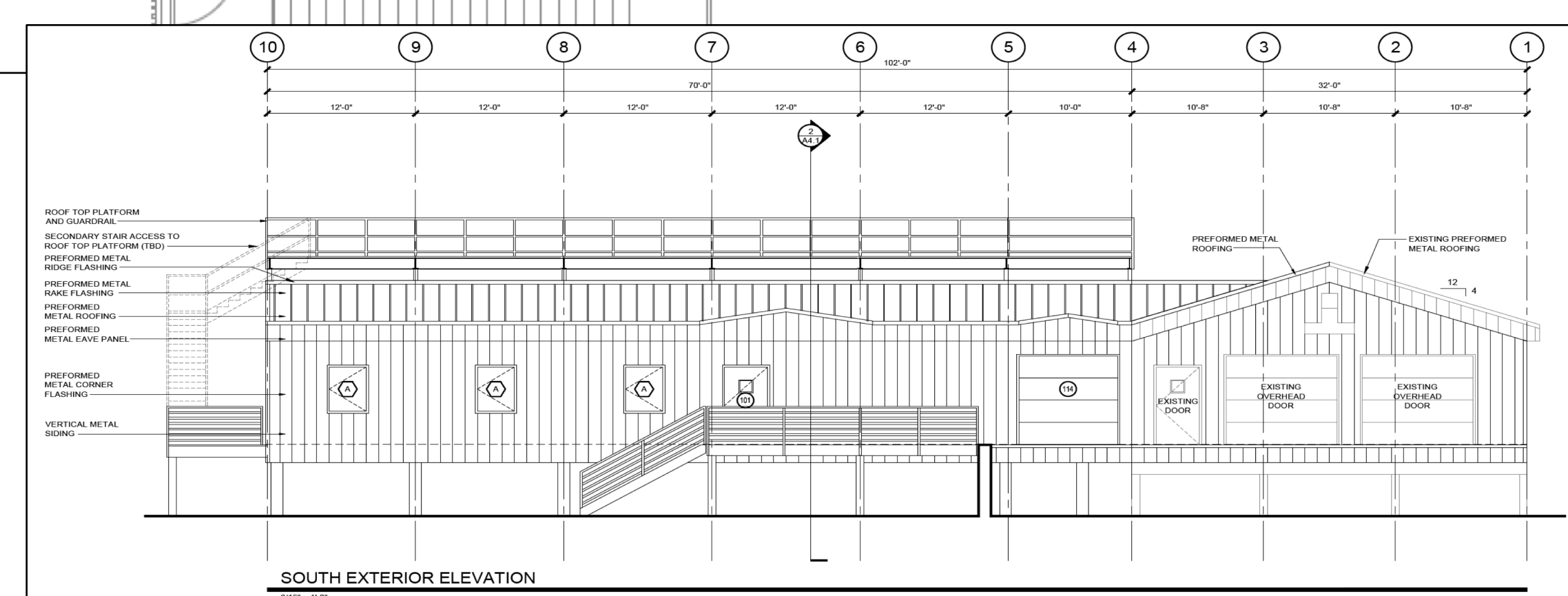


Highlights:

- Designed to be a LEED-Certified facility (potential for LEED-Silver)
- All LED lighting interior/exterior
- Roof hatches for lidar science
- Special material requirements so construction does not impact science
- Dedicated pump shelter on separate pilings to keep pump noise and vibrations outside of facility

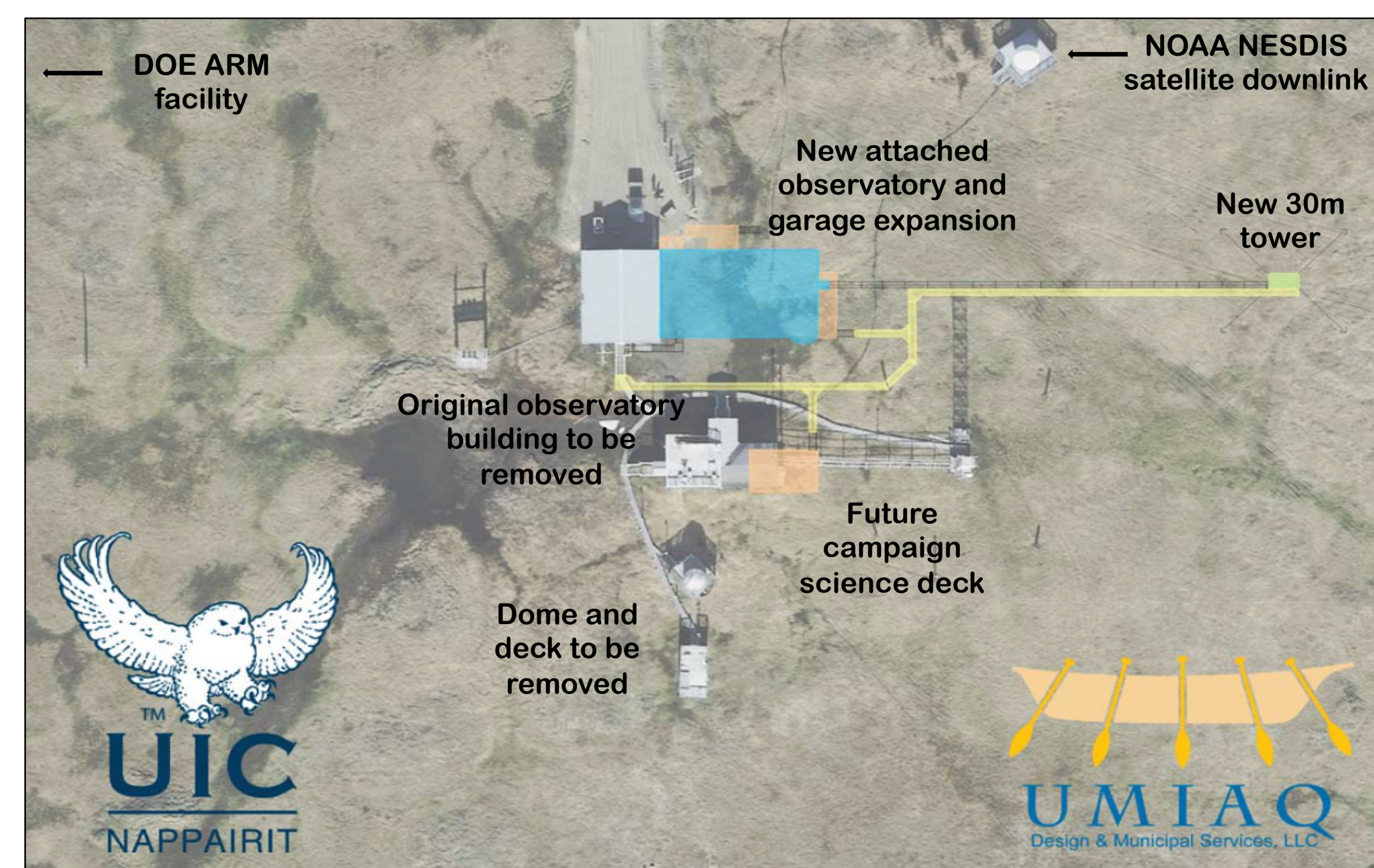
— Left (Front Elevation View):

- Front of observatory building
- New 2,940 sq-ft building to be attached to existing garage
- Adding vehicle bay to garage to house Bobcat/heavy equipment
- Roof deck covers ~ half of new building, access to front and rear of building

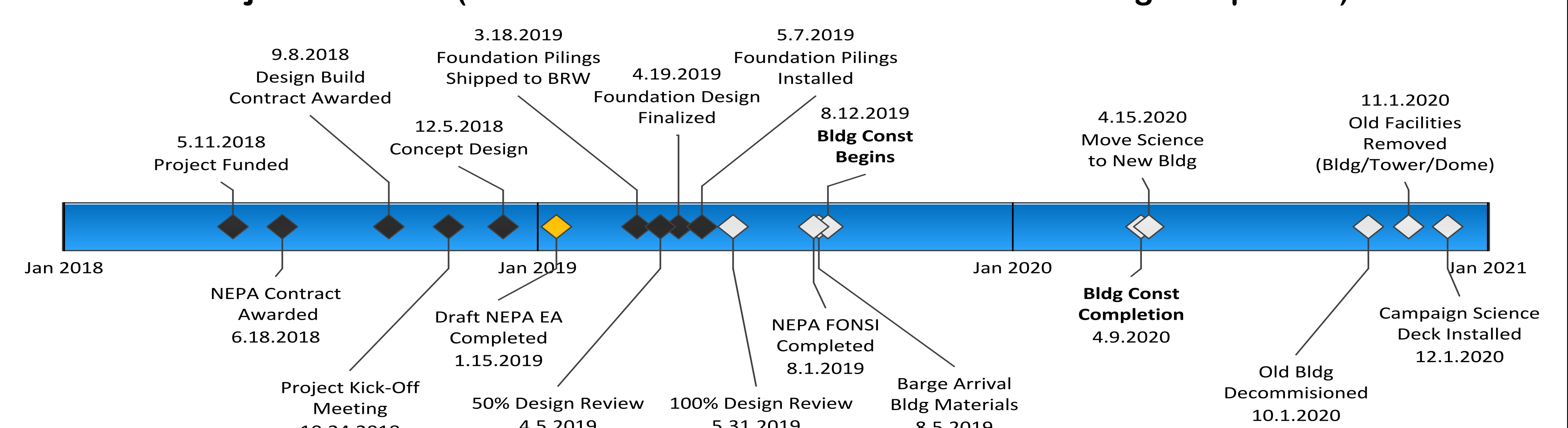


New Research Site Layout —

- 30-m tower placed approx. 200-ft east northeast of new building
- Dobson dome and solar radiation deck south of current building to be removed
- Dobson spectrophotometer relocated to southeast corner of new building in room with opening windows
- Campaign science deck to be installed south of new facility – final location TBD
- Deck capable of housing two 20ft instrumented shipping containers
- All new walkways with LED lighting to connect all new infrastructure
- New cable tray installed along walkway to tower to route air intake lines and signal cables into new building



Project Timeline (~20 months from contract award to building completion)



Challenges During Building Procurement & Design

- 1. Short Timeline from funding to award**
 - Less than 4 months to complete Statement of Work, Design Requirements, procurement package, contract negotiation, and contract award. Also needed to run NEPA concurrent.
- 2. "It takes a village" - Collaboration across NOAA**
 - ESRL/GMD – Observatory Operations team worked hand-in-hand with scientists, contract specialists, engineers, line office partners, and leadership to define requirements
 - OCAO/PPMD – Expertise in construction and contracting with proven design-build experience and model to follow
 - AGO/WAD – Crafted procurement package in record time, pushed contract negotiations forward, worked around the clock to meet the end-of-year federal procurement deadlines and awarded contract one day before deadline
 - OAR/CFO – Secured funds for OAR project and coordinated project with NOAA leadership and Congressional staff
- 3. Federal Government Shutdown – January 2019**
 - Shutdown delayed design ~1 month, but design team managed to complete design with no significant impact to construction timeline.
- 4. Design time vs. frozen tundra/foundation deadlines**
 - Foundation pilings must be installed when tundra is frozen. Hard deadline to finish spring installation – 7 May... foundation completed on 5 May.
- 5. Barge/Shipping Deadlines**
 - Limited shipping options for bulky items. Design timeline includes lead time to order supplies to be shipped up on the once/year barge. Foundation pilings were transported in Spring over a special "ice road" from Prudhoe Bay, AK.

Why Partner at BRW for Cooperative Research?

- Energy-efficient, temperature-controlled building on 100 acres of land with:
 - Unobstructed air sampling off the Beaufort Sea
 - 2 highly skilled full-time science technicians
 - Excellent power and communications infrastructure
 - Roof deck with clear southern view and power for instrumentation
 - 30-m instrument tower and dedicated building air inlet stack
 - Campaign science deck capable of holding two 20-ft instrumented sea containers
- 45+ years of operational data acquisition experience and logistics support in the Arctic
- 225+ long-term NOAA atmospheric core measurements available at the site
- Opportunity to test new instrumentation/procedures in fully-supported Arctic environment before remote field deployment
- BRW is a WMO/GAW Global station (1 of only 30) and WMO/GCW Surface Network CryoNet station
- Co-location for polar satellites and aircraft/vessel operations
- Co-located with the DOE/ARM North Slope Alaska and USGS Geomagnetic Observatory; NOAA/NESDIS polar satellite downlinks; and adjacent to BEO science
- Straight forward logistics: daily passenger and cargo flights, annual barge
- Over 1,200 peer-reviewed publications from BRW data to date.