Roof Reflectance Guidance
Tyndall Air Force Base
325 Civil Engineer Squadron

Tyndall AFB Installation Facility Standards (IFS) Exterior Finish, Color Palette, and Solar Reflectance Index (SRI)

1) The IFS is a Component Plan of the Installation Development Plan (IDP) or in the case of Tyndall's Rebuild - the Master Plan, per AFI 32-7062. All MILCON and NAF facilities are required to comply with the IDP and its IFS component plan by AFI 32-1023. The Tyndall AFB Base Civil Engineer (BCE), with responsibility delegated to the 325 CES Engineering Flight (CES/CEN) maintains and implements the IDP/Master Plan and its component plans, to include the IFS and all elements (including finishes/materials and color palettes). It is the responsibility of government contractors to source materials that adhere to the criteria/guidance in the IFS. The 325 CES BCE, Architect approval process is in place and must be followed to avoid materials applied where they would not be acceptable.
2) The Exterior Finish palette was approved by 325 Fighter Wing Installation Commander and BCE in 2019.
3) Tyndall AFB Base CES/CEN received direction from AFCEC SMEs and 325TH Wing Safety regarding reflectivity.
   a. **BLUF – there is not a clear-cut, reflectivity factor to "prevent" reflection from roof materials**.
4) The Air Force Corporate Facility Standards encourages reflectance to reduce heat transfer. http://afcfs.wbdg.org/facilities-exteriors/roof-systems/color-and-reflectivity/index.html
   a. Design and construct roof systems to shed water and shade walls and openings. Use their reflectance to reduce heat transfer.
   b. Comply with UFC 3-110-03 and ASHRAE 90.1 for Solar Reflectance Index (SRI) and thermal requirements.
5) **Solar Reflectance Index (SRI)** In Summary:
   a. A scale of 0 (zero) least reflective to 100+ (one hundred) + most reflective.
   b. The amount of glare/glint from solar reflectance depends on the material.
      i. Plastics, mirrors, solar reflectors, water, etc. all have more glare than metal.
      ii. Mirrors and water have more glare than plastics.
      iii. White plastic roofs [sprung temporary facilities and flat low slope white roofs (plastic)] are more reflective than any other roof.
6) Tyndall AFB is in Climate Zone: 2A Hot and Humid (ASHRAE 90.1) In Zone 2A, A Minimum Solar Reflectance Index of 55 minimum three-year-aged (ASHRAE 90.1)

Metal Roof Materials Used in Tyndall Exterior Finish Palette	
MT 3 (Light Silver)	59 (SRI)
Acrylic Coated Galvalume (Low Gloss 10 and below)	59 (SRI)
MT 4 (Medium Silver)	43 (SRI)
MT 5 (Dark Blue)	11 (SRI)
MT6 (Dark Blue)	25 (SRI)

Other Roof Colors and Materials for Comparison	
Mirror, Water	100++ (SRI)
Acrylic White (Bright White)	99 (SRI)
Fluid Applied Membrane (Bright White)	98 (SRI)
Metal Roof White (Bright White)	93 (SRI)
Metal Roof Tan (Light)	58 (SRI)
Metal Roof Tan (Dark)	42 (SRI)
Metal Roof Bronze (Medium)	31 (SRI)
Metal Roof Bronze (Dark)	27 (SRI)
Metal Roof Black (Matte)	26 (SRI)

7) UFC 4-211-01 -2017 Change 2 Revision 1 Section 2-1.6 addresses solar energy equipment being installed at the flight line. The UFC goes on to discuss any reflective surface and recommendations.
   "To prevent mirror-like reflections from building surfaces to aircraft in flight, provide roofs and other external surfaces with a specular reflectance compatible with the location of the building on the airfield. If the building is located so that glare is an operational hazard, provide surfaces of the building with a light reflectance of not more than ***10 measured at an angle of 85 degrees*** *in accordance with American Society of Testing and Materials (ASTM) D523, Specular Gloss at critical surfaces of the building."*
8) ASTM D523 Specular Gloss shows how to measure gloss. **Low Gloss** are values lower than 10 units.
9) MPI Standard states a gloss level of not more than 10 is a "Gloss Level 1, a traditional matte finish – flat".