**620-04: STANDARD HANDOUT FOR THE ENGINEER’S DESIGN REPORT**

**BACKGROUND:**

The Engineer’s Design Report serves to document the design considerations, engineering analysis and design selections that occur early in the design phase. The report must be an explanation of the engineer's design based on the scope of the project, critical aircraft dimensions and weight, and analysis of materials and site conditions. An Engineer’s Design Report is generally developed for all construction and equipment projects. This guidance is a supplement to the requirement found in the Airport Improvement Program (AIP) Handbook, Order 5100.38.

The design report should be available before or at the same time as the plans and specifications are submitted so they can be properly reviewed.

**GUIDANCE:**

The following guidance should be used for Engineer’s Design Reports on AIP projects in the Northwest Mountain Region.

***Special Note:*** To access the most current Regional Guidance, please visit the [ANM Sponsor Guide](https://www.faa.gov/airports/northwest_mountain/sponsor_guide/) website .

**Engineer’s Design Report**

1. **SCOPE OF WORK**
   1. A brief narrative on the scope of work including AIP eligible and ineligible work items.
   2. Unique and unusual site conditions.
   3. Age of the existing pavement.
   4. Current PCI value.
   5. History of work performed in project area.
2. **PHOTOGRAPHS**
   1. Include a representative number of photographs that depict the existing condition of the project site.
3. **LIFE CYCLE COST ANALYSIS**
   1. Compute a life cycle cost analysis comparing asphalt design sections to concrete sections and explain reasons for selecting final design. Final selection of pavement options may consider impacts to airport capacity during construction and project budget.
4. **DESIGN STANDARDS**
   1. List standards from FAA Advisory Circulars and other sources that are applicable to the project. The standards may include, but are not limited to:
      1. Design aircraft.
      2. Dimensional standards for project pavements.
      3. Longitudinal and transverse grades for runways, taxiways, shoulders, aprons, safety areas.
      4. Object free areas.
      5. Runway line of sight.
      6. Threshold siting for displaced or relocated thresholds.
      7. Runway and Taxiway lighting, signage, and marking layout.
      8. Siting and aiming criteria for sponsor installed PAPI.
      9. Siting criteria for REILS or sponsor installed approach light systems.
5. **ENVIRONMENTAL PROTECTION** 
   1. Discuss measures for temporary erosion and sedimentation control.
   2. If applicable, address requirements specific to the project and any monitoring required by other governmental agencies.
6. **SOILS AND GRADING**
   1. The geotechnical report should follow requirements outlined in AC 150/5320-6, *Airport Pavement Design and Evaluation*, current version. Include the geotechnical report as part of the Engineer’s Design Report submittal package. A summary of the geotechnical report should be referenced in the Engineer’s Design Report and include:
      1. Site conditions.
      2. Soil classification.
      3. Internal drainage.
      4. Frost depth.
      5. Water table.
      6. Soils characteristics and classification.
      7. Estimated CBR or K values and how derived.
      8. For pavement sections subjected to frost that use the reduced subgrade design option, specify the Frost Group (FG-1 thru FG-4) and corresponding CBR value.
      9. Identify any special compaction requirements of the existing subgrade materials.
      10. Identify potential for removal and replacement of unsuitable or wet material.
7. **DRAINAGE**
   1. The drainage analysis should follow the requirements outlined in AC 150/5320-5, *Airport Drainage Design*, and AC 150/5320-6, *Airport Pavement Design and Evaluation*, current versions.
      1. Address rainfall, runoff, storm drains, and detention ponds design.
      2. Review need for underdrains and pavement drainage layer.
      3. Describe pond design and special features taken to mitigate wildlife hazards.
      4. In flood plain areas, discuss any potential changes from the increase in pavement areas.
8. **PAVEMENT DESIGN**
   1. Use AC 150/5320-6, *Airport Pavement Design and Evaluation*, current version, and current pavement design program, *FAARFIELD*, to develop pavement sections, layout, and standard details. The pavement report must include:
      1. Design assumptions.
      2. Fleet mix (aircraft, load, and frequency of operations).
      3. Number of departures for each aircraft.
      4. Computer program pavement design output.
      5. Report pavement PCN number and gross weights in accordance with AC 150/5335-5, *Standard Method of Reporting Pavement Strength-PCN,* current version.
9. **PAVEMENT MARKING**
   1. Address marking requirements for compliance with AC 150/5340-1, *Standards for Airport Markings*, current version.
      1. Address any application of temporary markings.
10. **SIGNAGE**
    1. Address standard layout and design criteria for airport signage in accordance with AC 150/5340-18, *Standards for Airport Sign Systems*, current version.
       1. Address any temporary signage.
11. **LIGHTING**
    1. Define the scope of the lighting project and identify:
       1. Design criteria, design selection, and lighting layout.
       2. Existing power sources and circuit loading that was considered for new lighting installations.
       3. Existing cable and equipment conditions, including age, circuit loads, and reliability or grounding problems.
       4. Provide summary of electric design calculations that support the design selections.
       5. Location of rotating Beacon (installations must be coordinated using the 7460 airspace process.)
12. **NAVIGATIONAL AIDS (NAVAIDS)** 
    1. Provide details for any NAVAIDS being replaced or installed with the project, including siting and design details.
    2. Address schedule requirements for FAA reimbursable agreements and/or flight checks, if applicable.
13. **IMPACTS TO FAA OWNED FACILITIES**
    1. Identify impacts related to FAA owned facilities and equipment. Address:
       1. Construction impacts on FAA equipment when working in critical areas.
       2. Design impacts, such as grading in FAA equipment critical areas.
    2. Address schedule requirements for FAA reimbursable agreements and/or flight checks, if applicable.
14. **NON-AIP WORK**
    1. Identify all work items, including quantities, that are not eligible for AIP participation. These items must be listed on a separate bid schedule.
15. **ENGINEERS ESTIMATE** 
    1. Provide an engineer's estimate of probable construction costs by schedule and bid item.
    2. Provide a project budget that identifies all anticipated project costs (administrative, engineering design, construction inspection, construction, etc.).
16. **MODIFICATIONS OF STANDARDS (MOS)**
    1. Modifications to design, equipment, construction, or material standards must be initiated and coordinated in accordance with Order 5300.1. The MOS must be uploaded to the Airport Data and Information Portal, MOS Tool, for review and approval.
    2. Provide MOS Number and a brief description all sponsor initiated modifications to FAA standards.
    3. Identify any other changes to FAA standards and specifications that do not warrant a MOS.
17. **DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION**
    1. Identify approved DBE goal for the project.
    2. Identify potential work items that are suitable for participation by available DBE firms.
18. **BUILDINGS**
    1. Terminal Buildings
       1. Provide a description of the work to be done in the terminal if rehabilitation/reconstructing or describe the general layout if building a new terminal.
       2. Reference the AIP Handbook, Order 5100.38, Appendix N, for Terminal Building eligibility and provide clarification, if needed, for eligible vs. ineligibile areas.
    2. The size and design features of Snow Removal Equipment (SRE) and Aircraft Rescue and Fire Fighting (ARFF) buildings must be justified and approved by the FAA. Address the size and features using AC 150/5220-18, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, AC 150/5210-15, *Aircraft Rescue and Firefighting Station Building Design*, current versions, and the AIP Handbook, Order 5100.38.
19. **EQUIPMENT**
    1. Justify equipment requirement and need for the airport.
    2. Describe existing equipment and age of equipment to be replaced.
    3. For Snow Removal Equipment (SRE) justify size and capacity using requirements in AC 150/5220-20, *Airport Snow and Ice Control Equipment*, and AC 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety*, current versions.
    4. For Aircraft Rescue and Fire Fighting (ARFF) Vehicles state the current Part 139 index and index of the replacement vehicle. Vehicle specifications must meet AC 150/5220-10, *Guide Specification for Aircraft Rescue and Fire Fighting (ARFF) Vehicles*, current version, requirements.
20. **CONSTRUCTION SAFETY PHASING PLAN (CSPP)**
    1. Develop CSPP in accordance with AC 150/5370-2, *Operation Safety on Airport During Construction*, current version, and include as part of the bid package.
    2. A copy of the proposed CSPP should be submitted to the FAA project manager early in the project for the purpose of coordinating construction impacts with other FAA organizations through OE/AAA.
       1. The Air Traffic Organization may use this plan to perform a risk analysis using the Safety Management System (SMS) process for towered airports.
       2. This is a separate process from the SMS performed by the FAA Airports Division at hub airports in accordance with Order 5200.11, *FAA Airports (ARP) Safety Management System*, current version, which will be coordinated thought the ADO.
21. **MISCELLANEOUS WORK ITEMS**
    1. Address other project related work items such as seeding, fencing, etc.
       1. Fencing should be installed along the airport property line. The report must show property line limits and fence location. Any proposal to not install a fence along the property boundary must be discussed with the FAA project manager.
22. **PREDESIGN MEETING MINUTES**
    1. Include a copy of the Predesign Meeting Minutes in the Engineer’s Design Report.