PART 1 – GENERAL

These standards include mechanical system design guideline, installation, and material standards for use at SeaTac International Airport.

These standards are the minimum design standards for the planning and design. Compliance with these standards does not relieve the designer or consultant of the responsibility to apply sound professional judgment. These are minimum standards and are intended to assist, but not substitute for competent work by the consultant or the designer.

1.01 GENERAL DESIGN REQUIREMENTS

Design will be in accordance with all requirements of these standards or as imposed by State, Federal and other Port of Seattle Codes, Regulations, and Standards. In case of conflict between Codes, Regulations and Standards, the most stringent requirement in general shall be applied. Consult with Port of Seattle's Facilities and Infrastructure (F&I) for any clarifications, updates and revisions to these standards.

A. Engineers currently licensed in the State of Washington will prepare calculations, design mechanical systems and stamp and sign contract documents (drawings and specifications).

B. Design Mechanical systems for maximum reliability, adequate accessibility, minimal maintenance, safety, low operational cost and minimal transmission of vibration, sound or odors with optimum utilization of energy.

C. Centrally locate primary HVAC equipment in a mechanical room or penthouse with separate designated areas for electrical and communication systems. Provide Mechanical rooms or penthouse with equipment access and means to remove and replace largest and heaviest piece of equipment. Elevated mechanical rooms, penthouses and rooftop equipment will be provided with stairway or elevator access (no ship ladders). Provide service platforms for elevated primary air handling equipment. Primary air handling equipment will be provided with fully hinged side access doors.

D. Discuss the proposed system with the Port of Seattle's Facilities and Infrastructure (F&I) systems group before design begins. All Mechanical system projects require a presentation to the Mechanical Utilities System

Team (MUST) at 15%, 30%, 60% and 90% submittal stages for review to insure compliance with these standards.

E. Complete Mechanical drawings and specifications in accordance with Section 04 Mechanical Standards "General Provisions Design Submittal Guidelines."

F. Utilize Central Plant chilled water and steam services for building cooling and heating requirements as determined by MUST. Provide shell and tube heat exchangers to produce hot water for building heating and semi-instantaneous heat exchangers for domestic hot water requirements. Off-site projects that are determined to have an independent system from the central plant shall be studied using Washington State Energy Life Cycle Cost Analysis (ELCCA) by Washington GSA. Meet with MUST for discussion of systems to be studied. Reports shall be submitted and reviewed by Facilities and Infrastructure, no state submission requirements apply.

G. Design Mechanical systems with future capacity. Primary Air handling units, pumps, converters, main piping and ductwork distribution system should be installed with 15-percent extra capacity.

H. SeaTac Airport operates on a 24 hours by 7-day operation. Design systems to minimize disruption in existing services. Shutdowns of existing utilities and services may be necessary and must be carefully coordinated in the design and with the Port of Seattle. Temporary utilities may be necessary to maintain service to critical areas and operations. Temporary utilities can consist of air handlers, ductwork, piping, pumps, etc. to ensure a world class environment. Extended shutdown periods may be limited to specific time of day or seasons. Aviation Maintenance shall be notified at least seven working days in advance for any disruption in services. Temporary utilities must be shown and specified in contract, as well as a sequence of construction that has been agreed to with MUST.

I. Refer to Section II "General Provisions" and Section III "System Standards" for related design requirements.

1.02 MECHANICAL SYSTEM UTILITIES

The Central Plant (CMP#1) was established as part of the Main Terminal Expansion in the early 1970's and is located on the service drive level of the Parking Garage. Central Plant (CMP#1) consists of the following major mechanical systems:

A. Chilled Water System:
   1. Chillers (4) 1500 Ton, (3) 2000 Ton and (1) 2100 Ton
   2. Primary Chilled Water Pumping and Piping Distribution
   3. Secondary Chilled Water Pumping and Piping Distribution
   4. Cooling Towers (Located South of Main Terminal Parking Garage) (5) 3500 Ton Cells

B. Steam Heating System:
   1. Water Tube Boilers three 30,000#/hr. and one 40,000 #/hr. capacity
   2. Steam and Condensate Piping Distribution

C. Compressed Air:
   1. Air Compressors
   2. Compressed Air Piping Distribution

D. Main Distribution Loops: Three main distribution loops distributes chilled water and steam to facilities throughout the Main Airport:
   1. South Loop: Serves South Main Terminal, South Satellite, South Terminal Expansion and Concourse A.
   2. West Loop: Serves Central Main Terminal, Concourse B and Concourse C.
   3. North Loop: Serves North Main Terminal, North Satellite, and Concourse D.

1.03 PRECONDITIONED AIR

The Preconditioned Air Central Plant (CMP#2) was established as part of the PC Air Project in 2011 and is located in the basement level of the Central Terminal. Central Plant (CMP#2) consists of the following major mechanical systems:

A. Chilled Glycol System:
   1. Chillers: four 1,000 ton capacity 20 ^{0}F glycol
   2. Chilled Glycol Pumping and Piping Distribution
   3. Glycol Ice storage tank farm

B. Main Distribution Loops: Two main distribution loops distributes chilled glycol to passenger loading bridges throughout the Main Airport:

1. South Loop: Serves Concourse A and South Satellite.
2. North Loop: Serves Concourse B, Concourse C, Concourse D and North Satellite.

1.03 MECHANICAL SYSTEM (INSIDE OF TERMINAL BUILDINGS)

Mechanical systems within a building or facility are generally composed of the following:

A. Chilled Water System: Chilled water service is connected to one of the three main distribution loops with tertiary chilled water pumping system, cooling coils and piping distribution.

B. Heating Water System: Steam and condensate service is connected to one of the three main distribution loops with heat exchangers (steam-to-water), heating water pumping, heating coils and piping distribution.

C. HVAC System: Air handling units (supply, return fans, filters, coils and economizer dampers), exhaust fans (general and toilet rooms), terminal units and air distribution. Pneumatic and DDC controls systems do exist throughout the airport terminal.

D. Interior Water System: Interior water service is connected to site service water with pressure reducing stations, backflow prevention, plumbing fixtures, domestic hot water semi-instantaneous heat exchanger (steam to water), hot water re-circulation, tempered water and potable and non–potable piping distribution.

E. Fire Sprinkler System: Fire Sprinkler water service is connected to site service water with backflow prevention, alarm valves, supervisory and sectional valves, sprinkler heads and piping distribution.

F. Site Service Water System: Both fire sprinkler and interior water systems are served from a common site service water system.

G. Sanitary Waste, Vent and Storm System: Drains (floor, roof, etc), trap primers, traps, cleanouts and piping distribution.

H. Natural Gas System: Natural Gas primary piping supply distribution system primarily used for concessions kitchens. Piping exists in the CMP, across the load dock, up to central terminal, and along B and C concourse roofs. There is gas available at South Satellite, A Concourse, and D Concourse as well. Meet with MUST for further information.

I. Smoke Control System: Concourse A, Airport Office Building, Gina-Marie Lindsay Hall, Central Terminal, C1, and C4 facilities all possess smoke control that is inherent to the DDC system. Designers need to be cognizant of additional requirements when designing in these areas.